Impact Assessment of WTO-Agreement on Agriculture (AoA) on Oilseeds (Rapeseed / Mustard and Soybean) in Rajasthan

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Centre for Community Economics and Development Consultants Society (CECOEDECON)

CECOEDECON is a non-profit organisation, which has been working relentlessly for the downtrodden and the marginalized section since 1980s. CECOEDECON's mission is to take direct action to build the capacities of its target groups - Scheduled Castes and Scheduled Tribes, marginal farmers, the landless and the deprived women and children, so that they are able to take action, independently and effectively, to secure their long term well-being thereby, promoting their self-reliance and empowerment. CECOEDECON's core programmes run in the areas of natural resources management, health, gender and development, child development, institutional development programmes at the local levels.

At the national level, the organisation's networking and advocacy activities through India, along with the promotion of institutions at the state and national levels.

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PREFACE

CECOEDECON's consistent attempt of empowering the poor and marginalized community has crossed the journey of two decades. It certainly believes that the deepest horizon of community should be linked up with the global context for the sustainable development of the society. CECOEDECON's involvement in different campaigns facilitates to create awareness among the grassroot level community about the impacts of Liberalisation, Privatisation and Globalisation (LPG). It also helps to raise the voice of deprived communities, enable them to claim their rights and to place the demands at appropriate forum and time.

In the current World Trade Organisation (WTO) regime, trade in agriculture is very different than what it used to be in traditional form. As a signatory to WTO-Agreement on Agriculture (AoA), our government has changed policies already. As a consequence of the policy changes in Agriculture sector, the poor and marginalised communities are facing many hurdles for their survival – we have seen it and we had experienced it since 1990s leading to tariffs reductions. After the inception of WTO, there has been a change in different dimensions of the international trade rules, which is seriously creating the impact on agriculture sector, especially in the developing countries like India. Even after several rounds of negotiations WTO has failed to deliver the justice and meet the desired aspirations of the developing countries.

Under the leadership of Shri Sharad Joshi, Secretary, CECOEDECON, we have strived to build the knowledge base towards establishing the above facts in a scientific manner. CECOEDECON commissioned a research study entitled "Impact Assessment of WTO-AoA on Oilseeds (Rapeseed / Mustard and Soybean) in Rajasthan". Mustard is one of the main cash crops of Rajasthan; where as Soybean is new oil seed crop in this region.

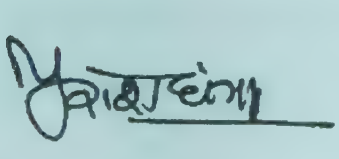
This study is an attempt to understand the impact of imports as well as market access in Indian market from the developing and developed world. The study brings home the message very starkly that farmers are suffering and seriously distressed due to change in trade policies of developing countries to WTO-AoA. The study analyses significant factors to assess the impact by evaluating the trend in post WTO-AoA regime. The study track the changes and trends in the post WTO regime that has seriously affected the economics of oilseed cultivation and survival of the poor and marginalized farmer community.

CECOEDECON has raised above said concerns in Make Trade Fair (MTF) Campaign through its partners in various districts of Rajasthan. This has enabled us to establish a momentum for fair trade through awareness creation and mass action to show strength and solidarity of the people. Further, MTF is bringing the attention of the national and international community towards the consequences of WTO agreements on the developing countries and to place the demands in front of the national and international authorities.

In these endeavours, we have received valuable assistance from innumerable associates for the study and campaign, including researchers namely Mr.B.M.Dixit and Ms. Nisha Varghese of Udaipur and Policy Analysis and Advocacy Unit,CECOEDECON especially for completing the study. We are thankful for their contribution. We are also thankful to Mr. Rajesh Soni for his contribution in text editing and graphic layout.

This study portrays the tip of the iceberg regarding the impact of WTO-AoA. The full shape and scale of the impacts will be threatening and felt across the nation and other developing countries. We hope that the study will prompt experts in both trade and agriculture sector to delve into the issues of impacts with regard to both national and state trade and agriculture policies as well as unravel the impact that LPG is impinging an Indian agriculture sector in particular, and country economy in general.

Wishing you an insightful reading



(Prakash Chhangani)

Convenor,

Make Trade Fair Campaign–Rajasthan.

INTRODUCTION

With agriculture coming into the ambit of the WTO, it was envisaged that trade in agriculture will bring about substantial change in the economy of the farming community. However decade of experience elicit the opposite and different picture from the aspiration of the WTO. Trade in agriculture is largely being influenced by the policies of the developed countries and rules are being framed to support and largely oriented to fulfill the objectives of the agriculture traders of the developed countries. As a consequence, farmers of the developing countries like India are facing serious challenges and struggling on the return of the production cost. Change in trading practice has created a tremendous pressure on the survival of the poor and marginalized farmer community.

This study is a humble effort towards impact assessment of the WTO - Agreement on Agriculture on Rapeseed / Mustard and Soybean in Rajasthan.In this publication Section–A elaborate on the emergence of WTO and AoA as well as the overview regarding Oil Seed scenario at global, national and state level. Section–B and section-C elaborately describe about the impact assessment on Mustard/Rapeseed and Soybean along with the perception of the Mustard/Rapeseed and Soybean farming community.

Impact Assessment of WTO-Agreement on Agriculture (AoA) on Oilseeds (Rapeseed / Mustard and Soybean) in Rajasthan

SECTION-A (Oilseed Scenario : Global / National / State)

1. AGREEMENT ON AGRICULTURE UNDER WTO

1.1 Emergence of WTO:

The eighth round of negotiation under General Agreement on Tariffs and Trade (GATT), which is popularly known as "Uruguay Round" is unique for the time spent for negotiation as well as for the contents of negotiation. It has been the longest negotiation by an international organization as it took 2631 days of negotiation in all. Agriculture and services found place in the negotiation for the first time in this round. The apex organization for the supervision and coordination of global trade, the World Trade Organization (WTO), replaced GATT and emerged as a follow up of Uruguay round of negotiations.

The structure of the WTO is radically different from that envisaged under previous proposals for a global trade body. In terms of governance, the WTO's principle of one-member, one-vote makes it unique among other multilateral institutions. Both the IMF and World Bank operate a weighted voting system with voting power depending on the amount of money contributed to the budget.

The original agenda of the Uruguay Round, put together at Punta del Este in 1986, made no mention of a possible global body for trade. Until the "Dunkel Draft" in 1991, the idea of a Multilateral Trade Organization (MTO) was not there. The shape of the MTO, as it then was, began to emerge only towards the end of the talks. The agreement to establish the WTO outlines the basic structure of the organization and the obligations that members have towards it. To join the WTO a prospective member has to accept every part of the Uruguay Round, treating it as a "single undertaking". This is a major advance from the GATT, some of whose rules were contained in voluntary codes and practices. The most popular agreement that on technical barriers to trade, had 45 signatories in 1993.

The WTO has a pyramid structure composed of descending layers of authority and control. At the top of the structure is the ministerial meeting. This

body meets every two years. Such meetings were already held at Singapore (1996), Geneva (1998), Seattle (1999), Doha (2001) and Cancun (2003), with the next set for Hong Kong in December, 2005. The meeting operates on the principle of one-member, one-vote. Under the ministerial meeting sits the General Council which operates as the Interim governing body. The council meets "as appropriate" and operates the same voting and membership principles as the ministerial meeting. Alongside the General council are the Dispute Settlement Body and the Trade Policy Review Body. Also operating under the supervision of the General Council are the committees and councils for different areas of trade policy.

1.2 Agreement on Agriculture:

Of the principal agreements of the Uruguay round, the Agreement on Agriculture and Sanitary and Phytosanitary agreements are of particular importance to agriculture. The agreement concentrates on liberalization in three areas: market access, domestic support and export subsidies.

Market access: Before WTO, the market access barriers involved both tariff and non-tariff barriers. The Uruguay round negotiations aimed at removing such barriers. For this purpose, it was required to replace agriculture specific non-tariff measures with a tariff which afforded an equivalent level of protection. The tariff schedules negotiated during the Uruguay round list the base rate of duty, in relation to which reductions in the first and subsequent years of the 1995-2000 implementation period were calculated. The base rates were calculated by the countries themselves as the difference between the internal and external price for the product concerned in the reference period (1986-1990). Some problems of tariffication cited include:

(i) Some members have bound all their agricultural tariffs in *ad valorem* terms but others have bound many of their agricultural tariffs in other forms including specific, mixed (ad valorem or specific) compound (ad valorem and specific) or technical tariff rates (e.g. based on alcohol or sugar content in the product).

(ii) The differences between the tariffs of different agricultural products (dispersion of tariffs) is very high as compared to industrial products. The higher the dispersion of tariffs, higher the cost of tariff protection in terms of economic welfare.

(iii) The tariffs on many basic agricultural products are very high which is also referred to as "tariff peaks" or "tariff spikes". Some of these tariffs are so high that they discourage import of even the minimum quantities.

(iv) Many a times, tariffs tend to be higher for processed products than for unprocessed products (tariff escalation). However, sugar and a few other product chains are subject to de-escalating tariffs. De-escalation occurs when the agricultural raw material is heavily protected.

Tariff quotas : Two types of tariff quotas were introduced as a part of the tariffication process.

(a) The first tariff quota had to be set up to establish minimum access opportunities where there had been no significant imports in the base period. The size of the quota was to increase from 3% of the 1986-1988 base period domestic consumption in 1995 to 5% at the end of the implementation period. (WTO.2001)

(b) The second tariff quotas were constituted to maintain the current access opportunities, where the process of tariffication would otherwise have resulted in a deterioration of market access conditions. In this case, the tariff quotas had to be equal to quantities imported during the base period.

Special safeguard: For products whose non-tariff restrictions have been converted to tariffs, governments can impose additional duties if the volume of imports of that product increases above a certain threshold or if the price of imports of that product falls below a trigger price. Special safeguard can only be used where the concerned countries have reserved the right to invoke this clause by designating the products in their schedules. Special safeguard cannot be applied to in-quota imports.

Domestic support: There are basically two categories of domestic support:

(a) Support with no or minimal distortive effect on trade-also called "Green Box" measures.

(b) Trade distortive support – also called "Amber Box" measures.

The measures under Green Box are exempt from reduction commitments and can even be increased without any financial limitation under the WTO. The "Amber Box"measure is subject to reduction commitments.

Apart from the measures covered by the Green Box, Agreement on Agriculture provides for exemption of three other categories of measures from

reduction commitments.

(i) Developmental measures in developing countries.
(ii) The second category relates to the so called "de minimis" levels of support. This provision allows measures such as market price support, direct production subsidies or input subsidies to be exempted if in any year, the aggregate value of product specific support does not exceed 5% (10% for developing countries) of the total value of production of that agricultural product. For non product specific support, e.g. input subsidies, the support is less than 5% of the value of total agricultural production. (WTO.2001)
(iii) The third category includes some direct payments under production limiting programmes, which are called "Blue Box" measures. "Blue Box" measures are partially decoupled i.e. they relate to production but not to current production.

All other forms of domestic support are subject to reduction commitments which are expressed in terms of "Total Aggregate Measurement of Support", non-exempt direct payments and other subsidies not exempted from reduction commitments. It covers both product specific and non-product specific support. Developed country members with a total AMS commitment are required to reduce base period support by 20% over six years and by 13% over 10 years for developing country members.

Export Subsidies: Agreement on agriculture defines export subsidies as subsidies contingent on export performance, specially those falling under reduction commitments. This includes:

(a) the sale of stocks for export by governments at prices below the domestic market price.
(b) Subsidies on incorporated products such as sugar or what contingent on their incorporation in export products such as biscuits.
(c) Cost reduction measures such as subsidies to reduce the cost of marketing goods for export.

Developed country members are required to reduce in equal steps over a period of six years, the base period volume of subsidized exports by 21% and the corresponding budgetary outlays for export subsidies by 36%. Developing country members are required to cut volumes by 14% and outlays by 24% over 10 years. (WTO.2001)

Other Provisions:

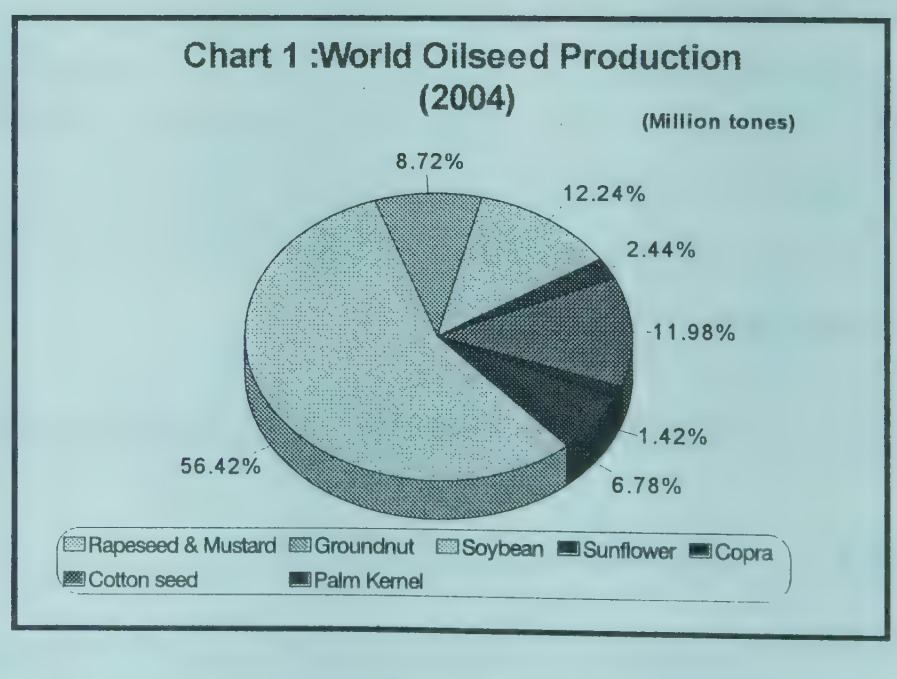
(a) Special and Differential Treatment: One of the essential elements of AoA is the special and differential (S&D) treatment provided for developing countries. The preamble states that the developed countries have agreed to take into account the special needs and conditions of developing countries in implementing their commitments on market access. They should achieve this by providing for a quarter improvement of opportunities and terms of access for agricultural products of particular interest to developing countries.

(b) Agreement on application of sanitary and phytosanitary measures: The SPS agreement affirms the right of WTO members to restrict international trade when necessary to protect human, animal or plant life or health from food-borne risks or animal and plant carried diseases.

The ministerial conference is the right forum to place before the cases of different countries based on their experiences in the process of implementation of various agreements. The Hong Kong conference is vital to take a stock of one decade of implementation of various agreements by developed and developing nations.

2. GLOBAL OILSEED ECONOMY : AN OVERVIEW

2.1 Production Scenario:



World output of oil seeds and oilseed products has risen substantially in the past 20 years. World production of major oilseeds was 380.07 million metric tons in 2004 and that of vegetable oil was 109.82 million metric tons. The countries like US, China, Brazil and India are the four largest vegetable oil economies in the world. While US, Brazil, Argentina, China and India are the largest producers of oilseeds, Malaysia and Indonesia are the largest producers of the low cost oilseed product palm oil, which is the most traded vegetable oil in the world. (United States Department of Agriculture,2005; Varghese, N.,2005)

2.2 Consumption Scenario:

World consumption of vegetable oils was 100.07 million metric tons in 2004. India and China, being the most highly populated countries in the world, are the largest consumers of vegetable oils. However their per capita consumption is very low (India 10.5 kg) as compared to developed countries like US where the per capita consumption is 33 kgs per year. (United States Department of Agriculture,2005; Varghese, N.,2005)

2.3 Trade Scenario:

US, Brazil, Argentina and EU account for over 80% of the world oilseed exports. While, world oilseed trade is less restricted by tariffs and other border measures, the same is less true with oilseed products. Both exporters and importers have used trade distorting policies in the past. Differential export taxes in Argentina and Brazil and high production subsidies in the EU include such policies. The applied tariff rates on oilseed products generally exceed those of whole oilseeds. This tariff escalation is adopted mainly to protect domestic crushers. The Organization for Economic Corporation and Development (OECD) countries grant up to $ 7 billion subsidy for oilseed production in this sector. World trade in this sector comprises of trade in oilseeds, oil meals and oils.

During the last one decade the world prices of oils have seen many ups and downs. In 2000-01, the vegetable oil prices touched their record low level. The international price of soybean oil fell from $ 575 per ton in 1995-96 to $ 336 per ton in 2000-01. The prices of peanut, palm and rapeseed oil fell from $ 928, $ 523 and $ 566 per ton in 1995-96 to $ 685, $ 235 and $ 372 per ton in 2000-01. However in the year 2003-04 the oilseed and oil prices have hit a 10 year high in the global market. (United States Department of Agriculture,2005; Varghese, N.,2005)

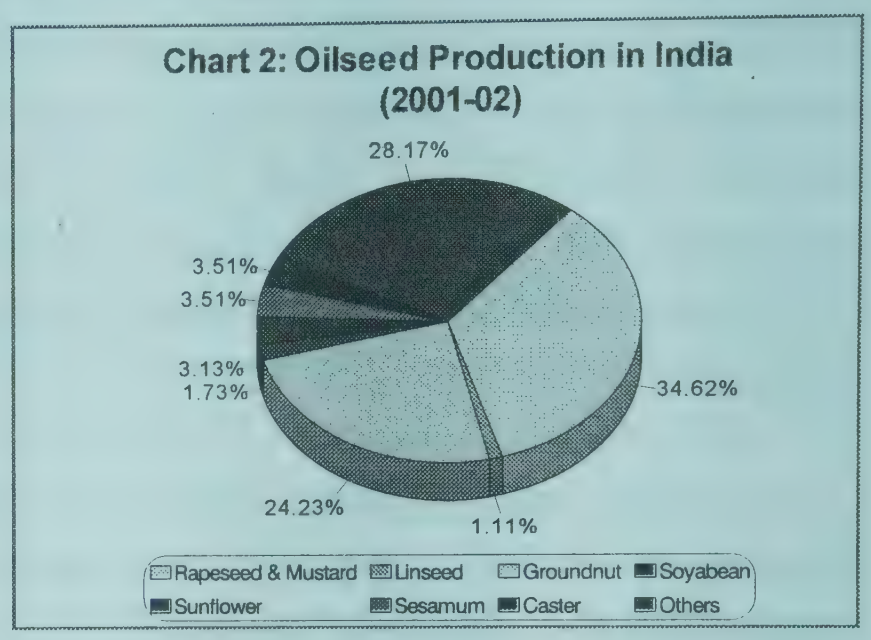
3. INDIAN OILSEED ECONOMY: AN OVERVIEW

3.1 Production Pattern:

Oilseeds stand next only to food grains in production and agricultural economy of the country. Bulk of the oilseeds and vegetable oil production in the country is derived from the nine annual oilseed crops i.e. groundnut, soybean, rapeseed and mustard, sunflower, sesame, safflower, niger seed, castor and linseed.

Technology Mission on Oilseed Production Programme (TMOPP) had brought about near self sufficiency in edible oils and India became exporter of oil seed products. Significant contribution in export came from soybean oilseed meal

and castor oil. Soybean production increased significantly in the states of Madhya Pradesh, Maharashtra and Rajasthan and that of castor in Gujarat. However gradual lowering of duties on import of vegetable oils under WTO regime resulted in unbridled import of cheap vegetable oils into the country which has depressed the price of domestic oilseeds. Low market prices and adverse weather condition in major oilseed growing states since 1999-2000 to 2002-03 have adversely affected the production and supply of edible oils and the demand-supply gap has increased significantly. The situation needs urgent steps addressing all the issues related to the oilseed sector holistically in harmonized way right from development of production technology to processing and marketing support by enabling policy empowerment.



India ranks 5th in the production of oilseeds next to US, China, Brazil and Argentina. In the year 2003-04, 23.44 million hectare area was put under oilseed cultivation, which produced 25.14 million tons of oilseeds. Groundnut, soybean and rapeseed and mustard together account for more than 80% of aggregate oilseed output. India accounts for about 7% of world oilseed output, 7% of world oil meal production and 6% of world vegetable oil production. (Ministry of Agriculture, 2004)

On production front, Indian oilseed sector is characterized by fluctuating output, low yields and depressed farm gate prices, which make oilseed

Table 1: Oilseed Production and Vegetable Oil Availability in India

Year	Production (Oilseeds) (million tons)	Domestic availability (Veg.Oil) (million tons)	Import of Veg. Oil (million tons)	Total availability (million tons)	Share of imports (%)
1995-96	22.10	6.47	1.16	7.63	15.20
1996-97	24.38	7.13	1.41	8.54	16.51
1997-98	21.32	6.06	1.27	7.33	17.33
1998-99	24.74	6.96	2.62	9.58	27.35
1999-00	20.71	6.02	4.20	10.22	41.09
2000-01	18.44	5.49	4.18	9.67	43.23
2001-02	20.80	6.20	4.32	10.52	41.06
2002-03	15.75	4.89	4.27	9.16	46.29

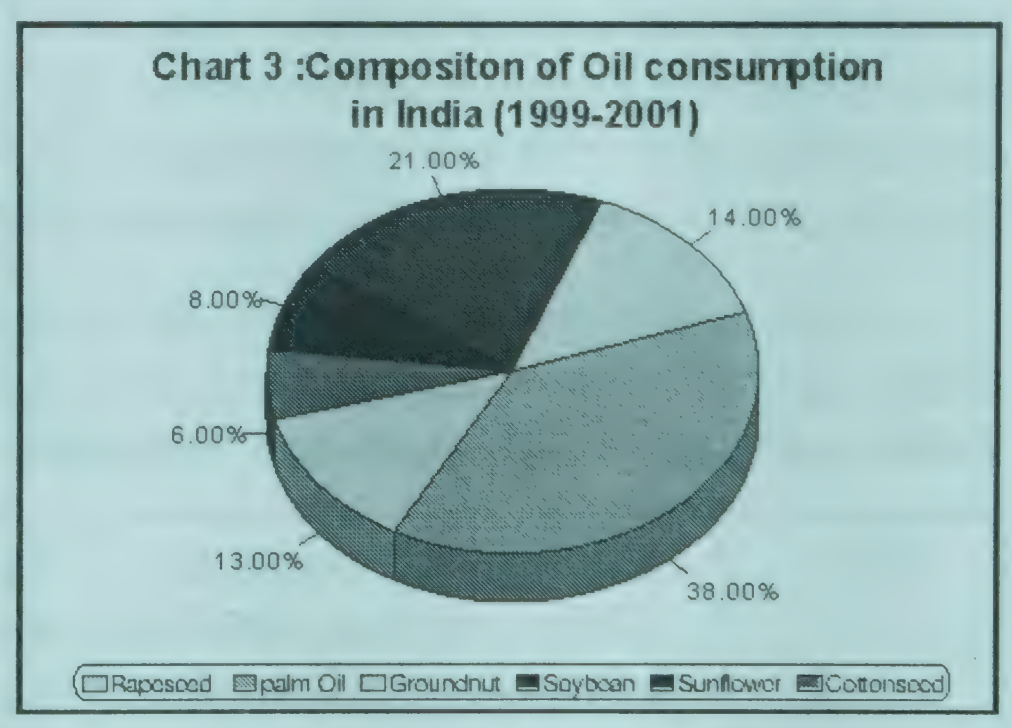
Source: Agricultural Statistics at a Glance 2004, Ministry of Agriculture, Govt. of India, New Delhi.

production unremunerative and to some extent unattractive. Looking to the present oilseed production scenario and rising consumption of edible oil in India, shift in agricultural production in favour of oilseeds is warranted, which is evident from the data given in Table 1.

3.2 Consumption Scenario:

India is amongst the largest consumers of vegetable oils accounting for about 10% of world vegetable oil consumption. Vegetable oil consumption in India in 2003-04 was 11.26 million tons. However, the per capita consumption of edible oil in India is low with 10.5 kgs as compared to the US average of 33 kgs. Besides, the consumption pattern is highly skewed with top 10% population consuming up to 20 kgs / capita and bottom 30% consuming less than 5 kgs/ capita (Hanumanth Rao, 2005). Consumption pattern in India is also characterized by strong regional preferences for oil with natural flavour. Mustard oil is consumed in north and east, groundnut oil in west and south and coconut oil in south.

The consumption pattern has undergone drastic changes since mid 90's. During early 70's, groundnut oil accounted for 58% of total oil consumption of 2.29 million tons followed by rapeseed and mustard 28%, cottonseed 10% and other oilseeds 4%. However, during the beginning of this decade the oil consumption has increased to 10.4 million tons having a diversified consumption pattern with palm (38%), soybean (21%), groundnut (14%), rapeseed (13%), sunflower (8%) and cotton (6%) (Dohlman *et al.*,2003). Consumption of edible oil is on a rise in the country, mainly due to growth in population, GDP growth, change in consumption pattern and government policies. (Ministry of Agriculture, 2004).



3.3 Trade Scenario :

For more than four decades since independence, Indian domestic market was insulated from competition by an extensive system of centralized planning and import controls. In June 1991, the government launched a comprehensive

economic liberalization programme to integrate domestic economy with global economy. Since the signing of WTO agreement, India has become a part of the international trade regime.

In India's efforts to be self-sufficient in food grains, the oilseed sector was left neglected, as a result of which country faced shortfall of edible oils. To overcome this situation, Government initiated TMOPP and made efforts to make oilseed cultivation appealing to growers. As a result, India became almost self sufficient in edible oils in early 90's. After signing WTO agreements, India's import policy on oilseed/oil trade underwent drastic changes. On the export front, exports of oilseeds were routed through NAFED during the period 1977 to 1982. Then came the Licensing Raj when only restricted quantities of oilseeds could be traded. India was forced to lift all the restrictions being maintained on balance of payment grounds after US successfully challenged India at the WTO. On the import front, edible oil which was in the negative list of imports was first dechannelised partially in 1994 with permission to import edible vegetable palmolein under Open General License (OGL) import at 65 per cent duty. This was followed by enlarging of oil basket under OGL import in 1995 when all edible oils were brought under OGL import at 30% duty (Except coconut oil, palm kernel oil an RBD palm oil). Then there was further reduction in duty to 20% duty plus 2% surcharge in 1996-97. To increase imports and curb high domestic prices of edible oils, duty was further reduced to 10% in July 1998.

Later on revision was affected on 1st March 2001 wherein custom duty on Crude Palm Oil (CPO) meant for vanaspati manufacture was raised from 25% to 75%. Duty on refined edible oil has been raised to 85% basic except refined soybean oil and refined mustard oil where duties are 45% basic and 75% basic respectively. Special Additional Duty (SAD) is levied on import of refined oil at 4 per cent. Import duty on oilseeds is 45%. More details on import are given in Table 2.

The import of vegetable oils has increased from less than one million tons in 1992-93 to more than 4 million tons during the current decade. Lack of self sufficiency in edible oils and rising dependence on imports has resulted in high share of imports to total availability. India is now a net exporter of oil cakes and net importer of vegetable oils. The change in policy has restricted export of oilseeds, while import of oilseed is restricted by high import duty.

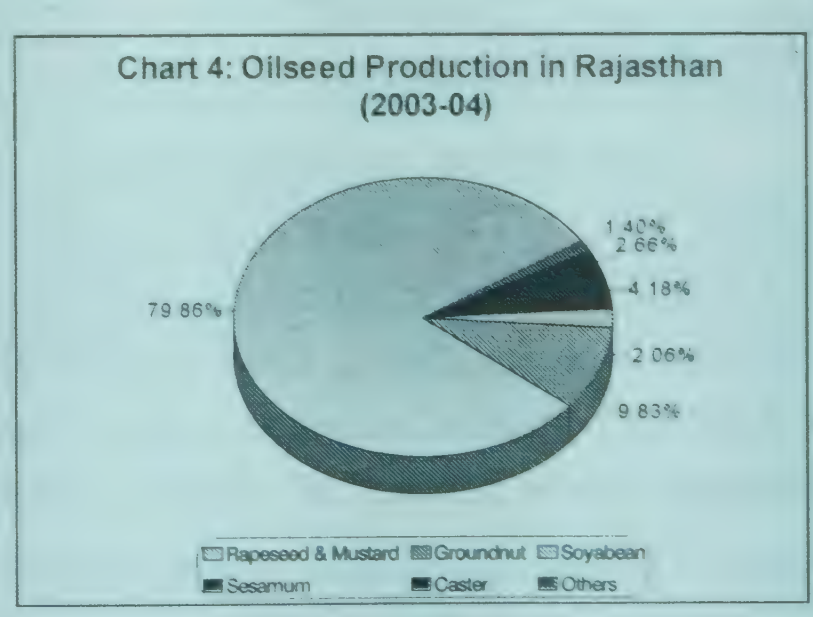
Table 2: Import Duty/Tariff for Oilseeds from 2000 in India

Year	Commodity	Import duty/tariff	
2000	Oilseeds	25% + 10% Surcharge	
	Rapeseed Oil	15% + 1.5% Surcharge	
	Soya Oil	15% + 1.5% Surcharge	
2001	Oilseeds	35%	
	Rapeseed Oil	35%	
	Soya Oil	35%	
		Basic Duty	**Bound Duty**
2002	Oilseeds	35%	100%
	Rapeseed Oil	75%	75%
	Soya Oil	45%	45%
2003	Oilseeds	30%	100%
	Rapeseed Oil	75%	75%
	Soya Oil	45%	45%
2004	Oilseeds	30%	100%
	Rapeseed Oil	75%	75%
	Soya Oil	45%	45%

Source: Agricultural Statistics at a Glance 2004, Ministry of Agriculture, Govt. of India, New Delhi.

3.4 SWOT Analysis of Oilseed/Oil Production and Import:

The demand for oilseed in the country can be met out either through domestic production or through import or combination of both. The extent of combination of domestic production and import has varied implications for the stakeholders like producer farmer, processor and consumer. The SWOT analysis of domestic production vis-à-vis imports in the context of different stake holders like producer farmer, processor and consumer in the context of India is summarized in Table 3.



4. DYNAMICS OF OILSEED PRODUCTION IN RAJASTHAN

Oilseeds account for about 15 per cent of gross cropped area of the state. Oilseeds are grown in both kharif and rabi seasons in Rajasthan. The major kharif

Table 3: SWOT Analysis of Oilseed/Oil Production and Import in India

S.No.	Type of supply/Stakeholders	Strength	Weakness	Opportunity	Threat
(A)	**Domestic Production**				
	(i) Farmer	Improvement in income and employment	Production of different oilseeds is location specific Low and unstable yield High cost of production	Enhanced income by attaining yield potentials and processing activities Oilcake export	Uncertainty in production Yield risk Price risk
	(ii) Processor	Easy access to raw material	Irregular and inadequate supply leading to low capacity utilization	Export of oil cake	Dependence on govt. incentives Mismatch between MSP and interna-tional prices of oils
	(iii) Consumer	Continued choice for locally produced oils	Has to pay higher price	Choice according to taste	Price fluctuations
(B)	**Import**				
	(i) Farmer	Choice for alternative crop	Disincentive for continued cultivation	-	Shift in cropping pattern towards less remunerative crops
	(ii) Processor	If oilseeds are imported, ensured supply of raw material	High dependence for raw material	Domestic sale of oils and export of cake	Imports of cheap oils leads to closure of processing units as import is confined to oils only
	(iii) Consumer	Availability at low price	Compromise with taste.	Price advantage due to reduction in demand supply gap	Blending of high value domestic products with low value imported substitutes.

Table 4: Area and Production of Oilseeds in Rajasthan over the Years (1955-56 to 2004-05)

A=Area ('000 ha); P=Production ('000 tons)

Year	Sesamum		Groundnut		Castor		Soybean		Rap. & Mus.		Linseed		Total	
	A	P	A	P	A	P	A	P	A	P	A	P	A	P
1955-56	389	75	43	37	2	1	-	-	244	95	120	45	798	253
1965-66	630	51	217	70	-	-	-	-	222	72	67	10	1137	203
1975-76	367	65	280	173	4	1	-	-	252	127	99	29	1003	395
1985-86	520	27	245	150	10	2	43	32	808	595	100	36	1929	912
1995-96	329	34	216	165	38	44	428	401	2691	2368	16	7	3838	3069
1996-97	420	88	245	273	36	48	466	453	2616	2622	19	11	3880	3529
1997-98	268	53	329	369	37	47	499	631	2812	2041	11	6	4419	3299
1998-99	242	18	332	362	39	55	680	895	2320	2233	15	9	4304	3815
1999-00	212	16	275	265	79	40	492	601	2495	2459	8	5	3635	3406
2000-01	232	32	196	181	121	46	659	456	1404	1303	9	5	2646	2033
2001-02	316	103	243	298	46	66	656	716	1760	1908	4	3	3106	3129
2002-03	190	11	241	166	26	22	472	236	1192	1178	1	1	2449	1754
2003-04	312	141	212	332	63	90	494	691	2063	2694	2	2	3160	3910
2004-05 (Provisional)	447	149	288	447	92	86	622	886	3287	3857	3	2	5133	5541

Source: Vital Agricultural Statistics of respective years records of Revenue Board, Rajasthan

crops are sesame, groundnut, castor and soybean. The major rabi oilseeds are rapeseed & mustard, taramira and linseed. The share of irrigated area in oilseed is varied for different oilseeds like sesame (4.5%), groundnut (41%), soybean (7.7%), castor (72%), rapeseed and mustard (85.5%). About 35% of total oilseed area is in kharif and the remaining 65% of oilseed area is in rabi season.

The area and production of oilseed crops like sesame and groundnut have not undergone any major changes over the years in the state. While the production of sesame did not show any remarkable trend over the years, that for groundnut could be considered as having positive trend till 1999. Though the area under castor is not very substantial, there has been a steady positive trend in its area till 2000. There after the area and production fluctuated for this crop. The soybean, a new oilseed crop introduced since early 80's in south-eastern Rajasthan, has shown spectacular growth both in area and production. Currently, the area under soybean is around 6 to 7 lac hectare with the production level yet to touch one million ton a year. The area under rabi oilseed crop rapeseed & mustard, which is a pre-dominant crop in most parts of the state, has increased from little more than 2 lac hectares till 70's to more than 32 lac hectares. Since 1997-98, there has been wide fluctuations both in area and production of rapeseed and mustard crop. The rabi oilseed crop linseed, earlier grown in few districts of south eastern Rajasthan, is no more an important crop of this region.

The total area under all oilseed crops fluctuated around 10 to 20 lac ha till mid 80's. The production of all oilseeds touched 1 million ton in later part of 80's. Since mid 90's all oilseeds covered area around 38 lac hectare and production exceeded 3 million tons a year. The 'peak' prevailed both in area and production of oilseeds during the period 1995-2000 in the state has undergone a reversal from 2000-01. More details can be seen from Table 4.

5. CHANGING WORK FORCE STRUCTURE OF RAJASTHAN IN NEW ECONOMIC REGIME

The total population of the state during 1991-2001 increased at a faster rate of 28.33% against 21.34% at the national level. The comparison of work force pattern in 2001 in relation to that in 1991 of the state given in Table 5 would provide indicators on the joint impact on employment of new economic regime initiated in early nineties and WTO agreement made in mid nineties in the country.

During 1991 the total workforce of the state was 17.10 million workers out of which 81.35% were main workers with full time work and 18.65% were

marginal workers with sub optimal work days of less than 183 days work in a year. During 2001, the size of total workforce increased to 23.78 million, out of which 73.30 per cent were main workers and 26.70 per cent were marginal workers. The workforce data of the state for the years 1991 and 2001 revealed that :

- The total work force increased by 39.04% in 2001 as compared to 1991 due to entry of more female workers in agriculture and allied activities.
- The full time workers increased by 25.27% and the marginal workers (sub-optimal) increased by 99% during this period.
- The male adult full time workers increased by only 14.84% and that of female full time workers increased by 68.13%.
- The large rate of increase of marginal workers, specially male marginal workers by 9.5 times in the decade is a matter of grave concern.

Table 5 : Employment Pattern in Rajasthan (1991 and 2001)

S. No.	Particulars	Persons ('000)		Males ('000)		Females ('000)	
		1991	2001	1991	2001	1991	2001
1.	Total	44006	56507	23043	29420	20963	27087
2.	Rural	33939 (77.12)	43293 (76.62)	17686	22427	16253	20866
3.	Urban	10067	13214	5356	6993	4711	6221
4.	Total worker	17104 (100)	23781 (100)	11360 (100)	14710 (100)	5744 (100)	9071 (100)
5.	Main Worker	13915 (81.35)	17431 (73.30)	11182 (98.43)	12841 (87.29)	2733 (47.58)	4595 (50.66)
	(a) Cultivator	8181 (47.83)	9582 (40.29)	6286 (55.33)	6211 (42.22)	1895 (32.99)	3371 (37.16)
	(b) Ag. Labour	1392 (8.14)	1008 (4.24)	894 (7.84)	654 (4.44)	498 (8.67)	354 (3.90)
	(c) H.H. Industry worker	279 (1.63)	501 (2.11)	232 (2.04)	373 (2.54)	47 (0.82)	128 (1.41)
	(d) Other worker	4063 (23.75)	6345 (26.68)	3770 (33.19)	5603 (38.09)	293 (5.10)	742 (8.18)
6.	Marginal Worker	3189 (18.65)	6351 (26.70)	178 (1.57)	1689 (11.48)	3011 (52.42)	4476 (49.34)
	(a) Cultivator	NA	3558 (14.96)	NA	852 (5.79)	NA	2706 (29.83)
	(b) Ag. Labour	NA	1515 (6.37)	NA	401 (2.73)	NA	1114 (12.28)
	(c) H.H. Industry worker	NA	177 (0.74)	NA	46 (0.31)	NA	130 (1.43)
	(d) Other worker	NA	1080 (4.54)	NA	555 (3.77)	NA	525 (5.79)

Source: Census of Rajasthan, 2001.
Note : Percentage given in Paranthesis.

Full employment opportunities for 16.89 lac male marginal workers and 44.76 lac female marginal workers would be possible through labour intensive production, processing and other activities in agricultural sector in the state. Concerted efforts are required for creation of new employment opportunities so that more and more work force gets employment to make their livelihood more secure. The oilseed production, particularly that of soybean and mustard is required to be accelerated in order to ensure employment opportunities for the work force, specially marginal workers including women. Full employment for marginal workers is a big task for which oilseed crops with production and processing potential can be a viable option.

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SECTION-B (Economic Status and Impact Assessment on Rapeseed and Mustard)

ABSTRACT

Trade in Agriculture and trade in Services found place in the General Agreement on Tariffs and Trade (GATT) negotiation for the first time during the eighth round of negotiation which is popularly known as "Uruguay Round". The implementation of Agreement on Agriculture (AoA) signed under WTO has posed problems for both developed and developing countries. The Agreement on Agriculture concentrates on liberalization in the areas of market access, domestic support and export subsidies. The liberalized agricultural trade policy adopted as per the requirements of AoA has set the national oilseed economy off balance.

The countries like US, Brazil, Argentina, China and India are the largest producers of oilseeds in the world. While, US, China, Brazil and India are the largest vegetable oil economies in the world. Malaysia and Indonesia are the largest producers of palm oil. Though, India and China are the largest consumers of vegetable oil in the world, their per capita consumption is very low. US, Brazil, Argentina and EU account for over 80% of world oilseed exports. Though the world oilseed trade is not much restricted, various trade distorting policies are being practiced by different countries for oils and deoiled-cakes. Since the inception of WTO, world oil prices have been fluctuating and have reached a record low in 2000-01 and hit a 10 year high in 2003-04.

India ranks 5th in the production of oilseeds next to US, China, Brazil and Argentina. Groundnut, soybean and rapeseed and mustard together account for more than 80% of aggregate oilseed output. Indian oilseed sector is characterized by fluctuating outputs, low yields and depressed farm gate prices. Though India is amongst the largest consumers of vegetable oil, the per capita consumption is as low as 10.5 kg/person/year. The consumption pattern is highly skewed and characterized by strong regional preferences for oil with natural flavour. However, Indian consumers are highly sensitive to price changes which can be seen from the fact that palm oil consumption has increased from less than 4% during early 70's to about 38% of total edible oils in the beginning of this decade. Since the edible oil import were put under the Open General License (OGL), the import of vegetable oils has increased from less than 1 million tons in 1992-93 to more than 4 million tons during the current decade.

Oilseeds are grown in both kharif and rabi season in Rajasthan and account for about 15% of gross cropped area of the state. About 35% of total oilseed area in the state is in kharif and the remaining 65% of oilseed area is in rabi season. With the population of the state increasing at a faster rate (28.33%), than that at the national level (21.34%) during 1991-2001 and with the increase in marginal workers by 99% during this period, it is warranted to have greater employment opportunities to secure the livelihood of this increasing population. Considering the labour intensity of oilseed production and processing, it seems to be a promising activity to accommodate the increasing workforce in different regions of the state.

Rapeseed and mustard accounts for 12.24% of global oilseed production. China (24%), Canada (14%), India (12.0%), Germany (7.6%) and France (7.02%) are the major rapeseed and mustard producing countries of the world. The world production has been growing @ 2.61% per annum mainly due to yield growth. Leading exporters of rapeseed and mustard include Canada and EU and leading importers include China, Japan, Mexico and some EU countries. India ranks third in the production of rapeseed and mustard in the world contributing about 12% of the world production. Inspite of positive growth in yield, the production of rapeseed and mustard in India has shown a declining trend mainly due to deceleration in area. Rajasthan, Uttar Pradesh, Haryana, West Bengal, Madhya Pradesh and Gujarat are the major rapeseed and mustard producing states in India. India is a net exporter of rapeseed and mustard seed. The oil imports have shown a declining trend and for the past two years India has been a net exporter of rapeseed and mustard oil as well. The demand of mustard oil both in domestic market and international market is declining due to availability of cheap substitute.

Rajasthan alone accounts for more than 5% of world rapeseed and mustard production. It is grown in all the regions of the state except the southern belt of Banswara and Dungarpur. Rajasthan is also called the "Mustard state" of the country. Some of the characteristics of rapeseed and mustard cultivation in Rajasthan are as follows:

(i) Production of rapeseed and mustard in the state has shown a declining trend inspite of positive growth in yield largely due to deceleration in area which can be attributed to dropsy problem during 1998-99 and import of low price edible oil.

(ii) Share of mustard area to rabi cropped area has been continuously declining.

(iii) In the post-WTO period, the cost of cultivation has increased at a higher rate as compared to gross returns.

(iv) Though among rabi crops wheat is more profitable in Rajasthan, rapeseed and mustard has the advantage of low requirement of operational cost and water as compared to wheat.

(v) Rapeseed and mustard processing with a very meager rate of return is not very attractive and hence seeds procured under MSP are lying in godowns due to diseconomy of their processing during post-WTO period.

(vi) The higher price of mustard oil as compared to soya oil and palm oil has reduced its domestic demand considerably.

(vii) Every hectare of rapeseed and mustard may generate employment opportunities to the extent of 41.7 man days for production and 1.12 man days for processing in addition to the secondary sources of employment for transport, storage, distribution, etc.

(viii) The MSP for rapeseed and mustard has been growing at a faster rate than FHP and WSP indicating government's concern to protect rapeseed and mustard growers.

(ix) Since 2000-01, the FHP and WSP has been less than MSP indicating that government's policy of importing cheap edible oil could not make it possible for these prices to be at par with MSP.

In view of the above facts it is evident that the reported dropsy problem was largely responsible for drastic reduction in area during 1998-99 to 2000-01. Consequently, this period also witnessed high import of rapeseed and mustard oil. Though government has announced very attractive MSP for rapeseed and mustard but common farmer is not able to access MSP in Rajasthan, which has made it ineffective. Low rate of return of rapeseed and mustard crushing seem to compel the processors to resort on blending for survival which is not a sustainable option. Besides, mustard oil consumers are highly price sensitive and the availability of cheap imported substitutes has lowered the demand of rapeseed and mustard oil. The cheap imports under OGL has led to rapeseed procured at MSP to lie in godowns for long period because of diseconomy in its processing. Thus, increase in domestic demand of rapeseed and mustard oil is a key factor which may shift the rabi cropped area in favour of rapeseed and mustard and that again would not be possible unless the import of cheap substitutes is restricted.

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1. WORLD PRODUCTION OF RAPESEED AND MUSTARD

Out of the global oilseed production of 380.07 million tons during 2004, about 12.24% was through rapeseed and mustard. Rapeseed and mustard is grown around 27 million hectare area by different countries of the world. The annual world production of rapeseed and mustard has gone upto 47 million tons in 2003-04 from around 31 million tons during 1995-96. The world productivity of rapeseed and mustard is 16-17 quintal/ha. The major rapeseed producing countries of the world include China (11.4 million tons), Canada (6.6 million tons), India (3.8 million tons), Germany (3.6 million tons) and France (3.3 million tons). (Food and Agriculture Organisation of the United Nations, 2004). The details of temporal trend and compound growth rates of rapeseed and mustard production in the world during (1995-96 to 2003-04) are given in Table 6.

Table 6: Compound Growth Rate of Rapeseed and Mustard Production in the World (1995-96 to 2003-04)

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	22389	30881	1379.293
1996-97	24138	35586	1474.273
1997-98	26568	36303	1366.418
1998-99	28402	43785	1541.617
1999-2000	26519	39984	1507.749
2000-01	23137	36305	1569.132
2001-02	23476	34760	1480.661
2002-03	24076	37309	1549.634
2003-04	27310	46959	1719.48
CGR (%/annum)	**0.56**	**2.61**	**2.04**

Source: FAOSTAT – Agriculture.

It can be clearly inferred from the above data that the world production of rapeseed and mustard has been increasing primarily due to increase in productivity. The productivity level has increased from 1379 kg/ha in 1995-96 to 1719 kg/ha in 2003-04. Leading exporters of rapeseed and mustard include Canada and European Union. The importing countries of rapeseed are China, Japan, Mexico and some EU countries.

2. RAPESEED AND MUSTARD PRODUCTION IN INDIA

India ranks third in the production of rapeseed and mustard in the world

contributing about 12% of the world production. In India, acreage under rapeseed and mustard has been 5.06 million hectares (2003-04). The productivity level of rapeseed and mustard in India is below the world average and is characterized by large inter-year fluctuations. The temporal trend and compound growth rates of area, production and yield of rapeseed and mustard in India during the period 1995-96 to 2003-04 are given in Table 7.

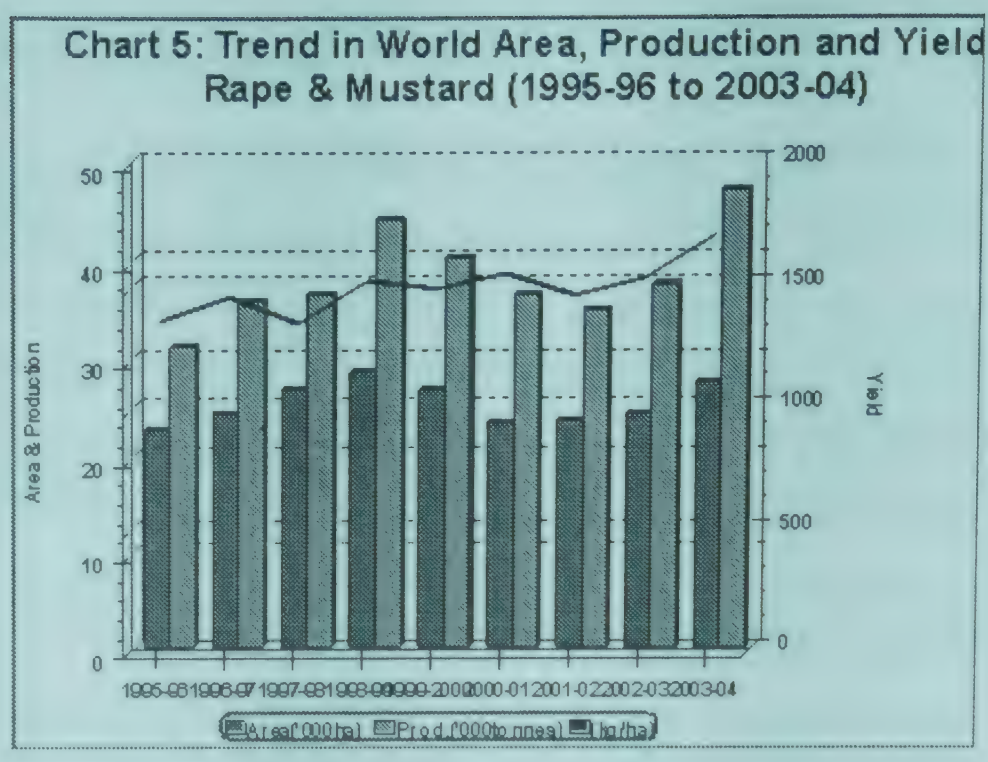


Table 7:Temporal Trend and Compound Growth Rate of Rapeseed and Mustard Production in India (1995-96 to 2003-04)

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	6550	6000	916
1996-97	6550	6660	1017
1997-98	7040	4700	668
1998-99	6510	5660	870
1999-2000	6030	5790	960
2000-01	4480	4190	935
2001-02	5070	5080	1002
2002-03	4520	3920	866
2003-04	5060	5830	1152
CGR (%/annum)	**-5.15**	**-3.04**	**2.22**

Source: Agricultural Statistics at a Glance, MoA, GoI, New Delhi.

During the last decade, the area under rapeseed and mustard has undergone drastic changes and has decelerated at the rate of 5.15% per annum. Though the yield levels accelerated at a compound growth rate of 2.22% per annum, the decline in area has offset the positive growth in yield resulting in deceleration in production by 3.04% per annum. The sharp decline in the oilseed

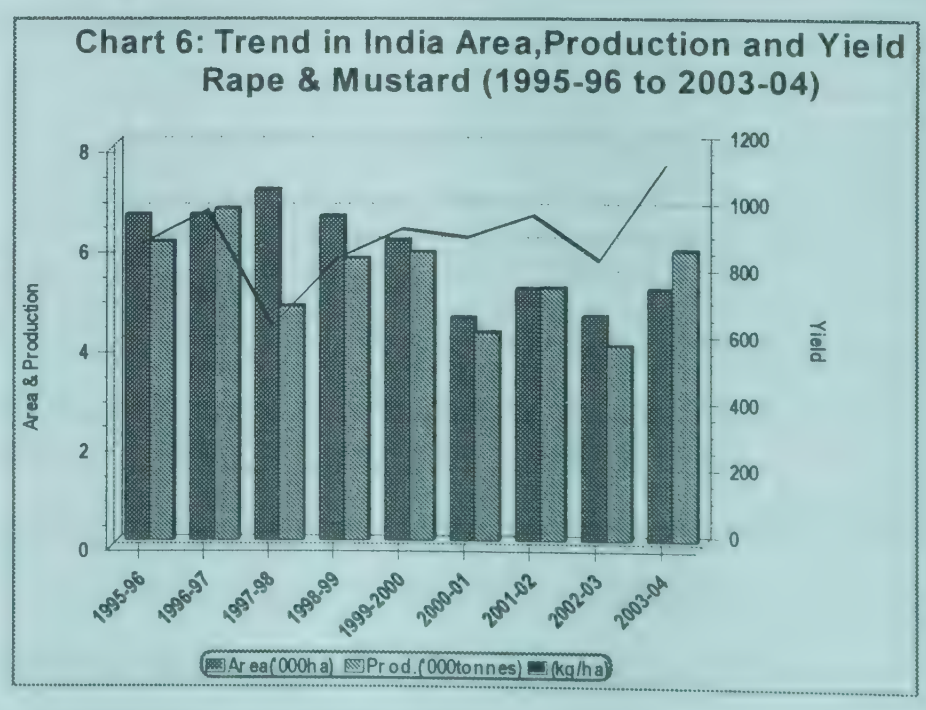
prices followed by large import of edible oil in general and rapeseed oil in particular lead to such a decline in area and production of rapeseed and mustard in India. The highest import of rapeseed oil during 1998-2000 would be due to the problem of 'dropsy' reported during this period.

India's share in world area and production of rapeseed and mustard is given in Table 8.

Table 8: India's Share in World Area and Production of Rapeseed and Mustard (1995-96 to 2003-04)

Year	Area (%)	Production (%)
1995-96	29.26	19.43
1996-97	27.14	18.72
1997-98	26.49	12.95
1998-99	22.92	12.93
1999-2000	22.74	14.48
2000-01	19.36	11.54
2001-02	21.50	14.61
2002-03	18.77	10.51
2003-04	18.53	12.42

India's share in world area under and world production of rapeseed and mustard has been declining in the post WTO period.



In India, Rajasthan leads in the production of rapeseed and mustard with around 35% of total rapeseed and mustard production followed by Uttar Pradesh (19%), Haryana (16%), West Bengal (8%), Madhya Pradesh (7%) and Gujarat (5%). The share of area and production of rapeseed and mustard in different states of the country is given in Table 9. Rajasthan alone accounts for more than 5% of world rapeseed production.

Table 9: Major Rapeseed and Mustard Producing States in India.

Major producing states	Average for three years (ending 1997-98)				Average for three years (ending 2002-03)			
	Area (Million ha)	Share (%)	Production Million tons)	Share (%)	Area (Million ha)	Share (%)	Production Million tons)	Share (%)
Rajasthan	2.93	41.16	2.42	41.16	1.60	34.19	1.52	34.70
UP	1.24	18.88	1.11	18.88	0.88	18.80	0.85	19.41
Haryana	0.58	8.50	0.66	11.22	0.52	11.11	0.68	15.52
MP	0.75	10.99	0.58	9.86	0.40	8.55	0.32	7.30
West Bengal	0.33	4.84	0.25	4.25	0.43	9.19	0.36	8.22
Gujarat	0.35	5.13	0.41	6.97	0.20	4.27	0.23	5.25
Others	0.64	9.38	0.44	7.48	0.66	14.10	0.42	9.59
India	**6.82**	**100**	**5.88**	**100**	**4.68**	**100**	**4.38**	**100**

Source: Agricultural Statistics at a Glance, MoA, GoI, New Delhi.

3. RAPESEED AND MUSTARD : TRADE SCENARIO IN INDIA

Of the major oilseeds traded in the world, rapeseed and mustard is the second most traded oilseed after soybean. The details of export and import scenario of rapeseed and its derivatives are given in Table 10.

Table 10: Trade Details of Rapeseed and its Derivatives by India.

Year	Seed import		Seed export		Cake export		Oil import		Oil export	
	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)
1995-96	147	29	1129	418	971707	77584	23224	16363	85	137
1996-97	648	224	603	261	1066624	115009	793	858	1276	1238
1997-98	126	46	766	383	1235725	139088	5689	3758	1412	1818
1998-99	4518	1587	423	166	441077	34124	227741	159243	473	497
1999-00	1648	644	748	371	107580	8378	287589	140483	331	425
2000-01	1489	704	740	233	69312	8448	49983	19288	393	423
2001-02	2131	913	12292	4629	253276	30249	16060	8436	3940	3053
2002-03	1839	759	17475	5420	248047	22821	750	586	887	1049
2003-04	1793	837	53822	10682	233882	27640	24	13	1881	1992
CGR (%/annum)	**34.2**	**44.95**	**69.52**	**57.84**	**-22.24**	**-20.05**	**-36.35**	**-39.54**	**24.53**	**20.29**

Source: FAOSTAT – Agriculture.

The seed import of rapeseed ranged from 0.126 thousand metric tons in 1997-98 to 4.5 thousand metric tons in 1998-99 during the last one decade. However the seed export which was less than a thousand tons till 2000-01, started picking up from 2001-02 and has reached a peak of 53.8 thousand tons in

2003-04. The export of rapeseed cake from India started declining from more than a million tons in 1997-98 to 0.44 million tons in 1998-99 and has started decelerating thereafter. The import of rapeseed oil fluctuated over the years reached a peak of 0.29 million tons in 1999-2000 and has started declining thereafter and is almost negligible now. The quantity and value of rapeseed and mustard oil exported from India is not substantial in these years.

Some of the reasons for decelerated import of rapeseed oil which has become almost negligible now may be due to factors like:

(i) Prevailing bound and applied tariff rate of 75% which is higher compared to soybean (45%).

(ii) The yield gap of rapeseed and mustard in India as compared to that of the world average is not very high, thereby the exporting countries like Canada may not have much advantage in terms of cost of production to export rapeseed oil to India.

(iii) The consumption preference of rapeseed oil by the domestic consumers of India is confined to limited region/segment only.

The net trade of rapeseed and mustard seed and oil is given in Table 11.

Table 11: Net Trade of Rapeseed and Mustard Seed and Oil

Year	Net seed export (tons)	Net oil import (tons)
1995-96	982	23139
1996-97	-45	-483
1997-98	640	4277
1998-99	-4095	227268
1999-2000	-900	287258
2000-01	-749	49590
2001-02	10161	12120
2002-03	15636	-137
2003-04	52029	-1857

Note : This table has been derived from Table 10.

The figures show that India imported significant amount of seed and large quantity of rapeseed and mustard oil during the period 1998-99 to 2000-01. This was mainly because of the dropsy problem during this period. Since 2002-03, India has become net exporter of both mustard seed and oil.

4. RAPESEED AND MUSTARD PRODUCTION IN RAJASTHAN

Rapeseed and mustard is a rabi oilseed crop of Rajasthan which was initially grown in Alwar, Bharatpur region in 1 to 2 lac hectare area in a year. Since the launching of national oilseed mission programme in 1980's, the area under this crop remarkably increased in this region. Subsequently, the acreage under rapeseed and mustard has started expanding to regions like Jaipur, Sikar, Jhunjhunu, Ganganagar, Jodhpur, Jalore, Nagaur, Pali, etc. Currently, rapeseed and mustard is grown in all the regions of the state except the southern belt of Banswara and Dungarpur. During 2004-05 (according to the provisional figures), the area under rapeseed and mustard has gone upto 3.29 million hectares with a production of 3.86 million tons in the state. More than 90% of rapeseed and mustard in the state is irrigated through different sources (Unpublished Revenue Records, 2004-05,GoR). Remarkably, the productivity of rapeseed and mustard has also increased substantially over the years and is more than a ton per hectare. According to the provisional figure, the productivity of this crop during 2004-05 is more than 14 qtl/ha which is getting closer to the world average yield of the crop. The temporal pattern of growth in area, production and yield of rapeseed and mustard in Rajasthan could be seen from Table 12.

Table 12: Area, Production and Yield of Rapeseed and Mustard according to Five Year/Annual Plans in Rajasthan.

Plans	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
I Plan (1951-56)	158	55	348
II Plan (1956-61)	250	84	337
III Plan (1961-66)	265	87	328
3 Annual Plans (1966-69)	190	58	307
IV Plan (1969-74)	298	155	520
V Plan (1974-79)	315	170	539
Annual Plan (1979-80)	349	149	427
VI Plan (1980-85)	704	534	758
VII Plan (1985-90)	1099	962	875
2 Annual Plans (1990-92)	2071	1900	915
VIII Plan (1992-97)	2407	2075	862
IX Plan (1997-2002)	2158	1988	921
2002-03	1192	1178	989
2003-04	2063	2694	130

Source: Vital Agricultural Statistics, GoR, Jaipur.

Assuming the per grower household area under rapeseed and mustard around 0.58 hectare (Varghese, 2001), there may be about 56 lac households growing rapeseed and mustard in the state (2004-05). More than three-fourth of farm households of the state grow mustard crop. Rajasthan has already earned the name as the 'Mustard State' of the country. Any economic set back for this crop will be a severe blow for the rural economy and livelihood system of the state.

The rapeseed and mustard area which has reached 3.28 million hectare in 1997-98 has started declining thereafter drastically and has reached the lowest area of 1.19 million hectare in 2002-03 which may be attributed to the acute drought situation which prevailed in that year and the global factors also adversely affected this crop. It is worth mentioning that the year 2003-04 and 2004-05 happened to be promising years for oilseeds with record production of 4 and 5.5 million tons respectively.

The trend and growth rates of area, production and yield of rapeseed and mustard for the period 1995-96 to 2003-04 in Rajasthan are given in Table 13.

Table 13: Temporal Trend and Compound Growth Rate of Rapeseed and Mustard Production in Rajasthan (1995-96 to 2003-04)

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	2810	2420	861
1996-97	2690	2660	985
1997-98	3280	2190	670
1998-99	3000	2480	827
1999-00	2570	2480	965
2000-01	1430	1310	918
2001-02	1840	1940	1056
2002-03	1192	1178	989
2003-04	2063	2694	1300
CGR (%/annum)	**-7.79**	**-4.17**	**3.92**

Source: Vital Agricultural Statistics, GoR, Jaipur.

The compound growth rate in area under rapeseed and mustard in Rajasthan registered negative growth rate of 7.79%/annum during post WTO period. During this period the production growth was also negative (4.17%/annum), despite positive growth rate of 3.92%/annum in yield. It is evident that the production growth is largely governed by the pattern of area

growth. The drastic decline in area under rapeseed and mustard from 2000-01 to 2002-03 is a matter of great concern, which is required to be looked into in terms of domestic and global factors for such an unwanted phenomenon.

Rapeseed and mustard is grown in almost all parts of Rajasthan. Table 14 gives a five year average of area and production of rapeseed and mustard in Rajasthan.

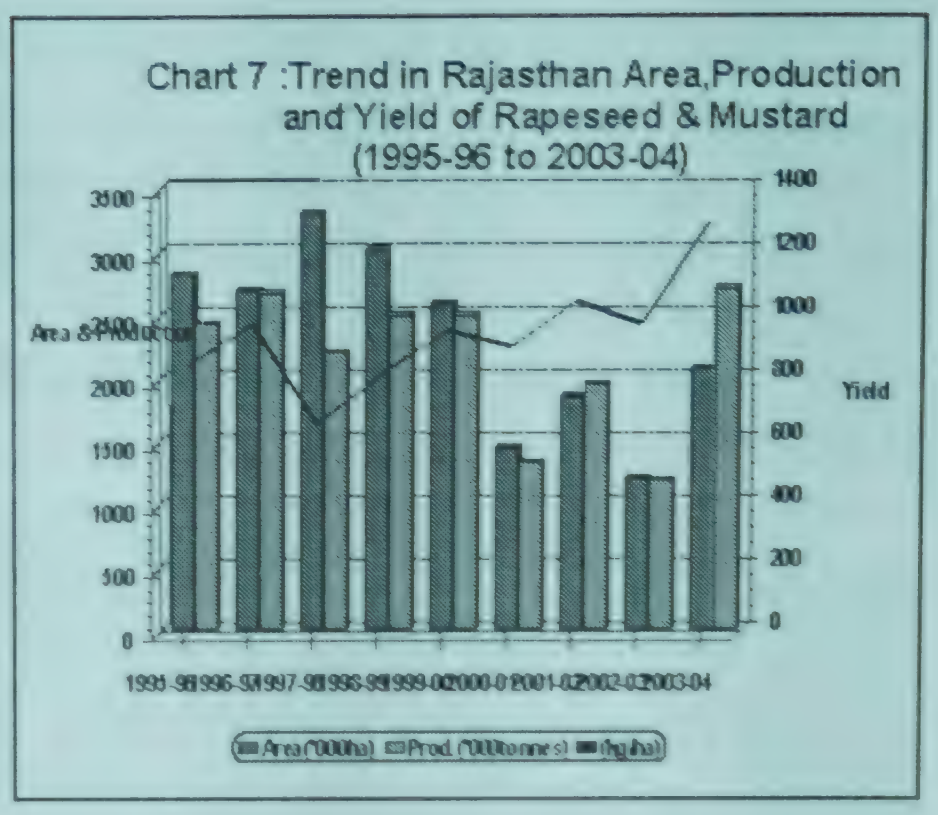


Table 14: Rapeseed and Mustard Producing Districts in Rajasthan

Districts	Average of five years (ending 2001-02)			
	Areas (ha)	Share (%)	Production (tons)	Share (%)
Ajmer	25081	1.16	14495	0.73
Jaipur	104629	4.85	71583	3.60
Dausa	59054	2.74	46722	2.35
Sikar	40708	1.89	34479	1.73
Jhunjhunu	100464	4.66	92308	4.64
Alwar	199017	9.22	214389	10.78
Bharatpur	159313	7.38	163614	8.23
Dholpur	59491	2.76	64562	3.26
S.Madhopur	131675	6.10	92272	4.64
Karoli	55760	2.58	48375	2.43
Bikaner	29027	1.34	23281	1.17
Churu	30194	1.40	26828	1.35
Ganganagar	208440	9.66	229054	11.52
Hanumangarh	68647	3.18	66108	3.32
Jodhpur	60080	2.78	62465	3.14
Jaisalmer	37495	1.74	34199	1.72
Jalore	91364	4.23	77451	3.89
Barmer	15336	0.71	14181	0.71
Nagaur	107647	4.99	100905	5.07
Pali	81208	3.76	58361	2.93
Sirohi	20427	0.95	21341	1.07
Kota	72721	3.37	81497	4.10
Baran	102281	4.74	108175	5.44
Bundi	63864	2.96	60322	3.03

(Contd...)

(Contd...)

Jhalawar	25095	1.16	21768	1.09
Tonk	142493	6.60	105845	5.32
Banswara	73	Neg.	66	Neg.
Dungarpur	194	Neg.	173	Neg.
Udaipur	9415	0.44	8537	0.43
Bhilwara	19339	0.90	17638	0.89
Chittorgarh	34970	1.62	25387	1.28
Rajsamand	2650	0.12	2499	0.13
State	**2158152**	**100**	**1988880**	**100**

Source: Vital Agricultural Statistics, GoR, Jaipur

4.1 Share of Mustard Area to Rabi Cropped Area in Rajasthan

The share of rapeseed and mustard area to rabi cropped area of the state is given in Table 15.

Table 15: Share of Rapeseed and Mustard Area to Rabi Cropped Area in Rajasthan (1995-96 to 2002-03) ('000 ha)

Year	Rabi cropped area	Mustard area	Share (%)
1995-96	7493	2810	37.50
1996-97	7708	2690	34.90
1997-98	9295	3280	35.29
1998-99	9625	3000	31.17
1999-00	7085	2750	38.81
2000-01	5424	1430	26.36
2001-02	6383	1840	28.83
2002-03	4887	1192	24.39

Source: Vital Agricultural Statistics, GoR, Jaipur.

Due to recurrent drought the rabi cropped area has been on a decline from 1998-99. Some decline in the area under rapeseed and mustard must have been due to this phenomenon. However, the sharp decline in the share of mustard area to rabi cropped area is indicative of reduced preference by the farmers for this crop. As a natural course, the area under rapeseed and mustard should increase during less rainfall years as the water requirement of this crop is much less than wheat and other irrigated rabi crops. The rapeseed and mustard crop emerged as a farmer friendly crop in terms of natural resources like water and economic parameters like less cost of cultivation. The sharp decline in area as well as production of this crop during the recent years is a matter of great concern as it will have economic implications for the grower households. The rapeseed and mustard crop does play a crucial role in the socio-economic prosperity of the farmers of the state. Being a cash crop, the cash flow from this crop did pave way

for the investment pattern for farm capital. The set back being faced by this crop in Rajasthan is required to be considered with utmost importance as reduction of every one hectare of land under this crop effects two farm households directly.

4.2 Cost of Production of Rapeseed and Mustard in Rajasthan:

The details of cost of cultivation of rapeseed and mustard for the years 1995-96 and 2000-01 are given in Table 16.

Table 16: Break-up Cost of Cultivation per Hectare of Rapeseed and Mustard in Rajasthan (1995-96 and 2000-01)

(Rs./ha)

Items	**1995-96**	**2000-01**
Human Labour	2015.12	3343.37
Bullock Labour	203.42	242.73
Machine Labour	837.23	1633.08
Seed	109.66	136.63
Fertilizer & Manure		
Fertilizer	695.68	892.58
Manure	18.37	-
Total	714.05	892.58
Insecticides	7.23	2.84
Irrigation Charges	519.08	1044.73
Int. on Working Capital	86.46	137.30
Fixed Cost	2915.49	4486.62
Rental Value of Owned Land	1890.95	2534.38
Rent Paid for Leased Land	73.18	182.88
Land Revenue, Ceases & Taxes	10.93	10.96
Dep. on Implements & F. Flug.	113.13	149.52
Int. on Fixed Capital	827.30	1608.68
Total Cost	**7407.02**	**11919.88**

Source: Cost of Cultivation of Principal Crops in India (Feb. 2000) by MoA , GoI, New Delhi.

During the period, the operational cost for rapeseed and mustard cultivation has increased by 65.47% and the fixed cost has increased by 53.89%. Consequently the total cost of cultivation has increased by 60.91%. The increase in variable cost of cultivation of rapeseed and mustard has been mainly due to increase in cost of human labour, machine labour, fertilizer and irrigation. The increase in machine labour cost by more than 95% could be due to hike in diesel prices during the post WTO period. Similarly, the irrigation charges has gone up by more than 100% during this period which again is largely due to increase in electricity charges and diesel prices. The 60% increase in cost of cultivation over the period of five years of post WTO period implies almost 12% increase in cost of cultivation every year for rapeseed and mustard crop in Rajasthan.

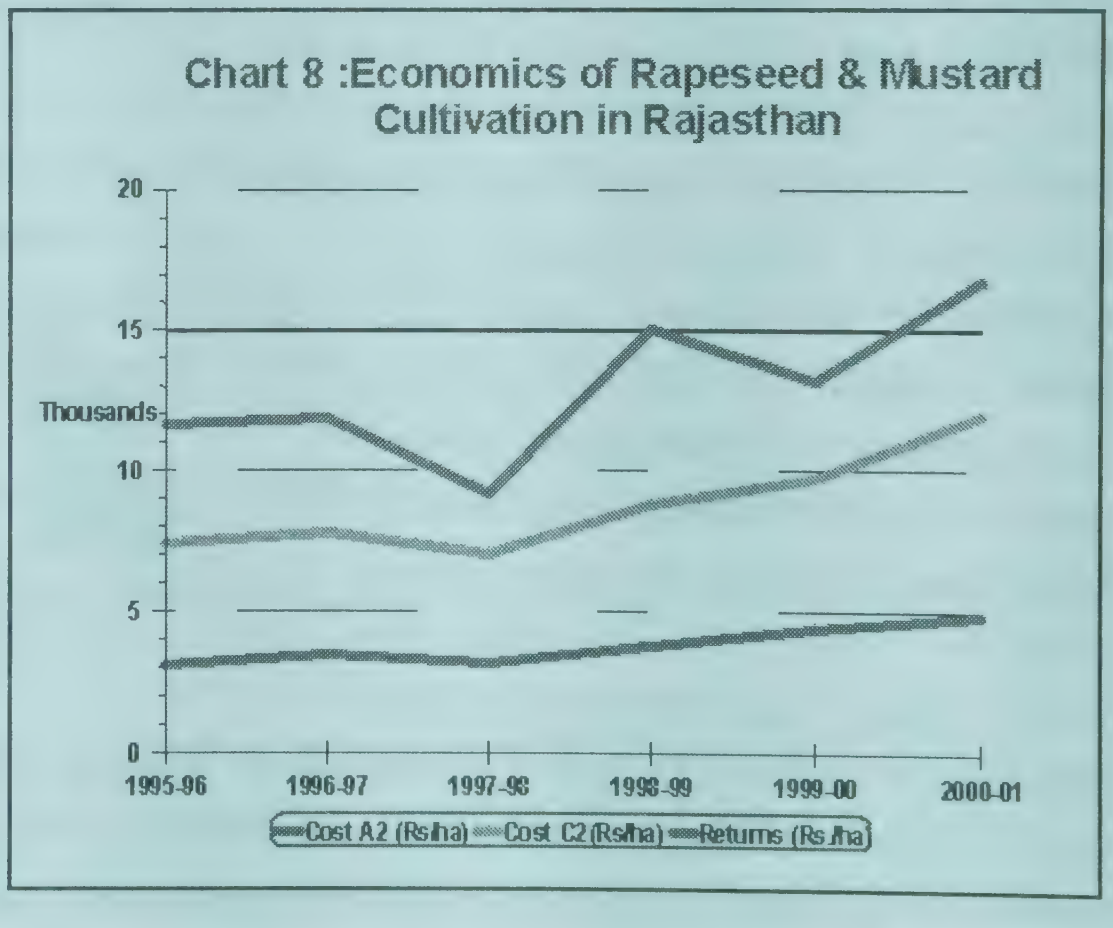
The details of economics of rapeseed and mustard cultivation over the years in Rajasthan are given in Table 17.

Table 17: Economics of Rapeseed & Mustard Cultivation in Rajasthan

Year	Cost of Cultivation (Rs./ha)		Cost of Production (Rs./qtl.)		Returns (Rs./ha)
	Cost A2 (Paid cost)	Cost C2 (Paid + imputed)	Cost A2 (Paid cost)	Cost C2 (Paid + imputed)	
1995-96	3050	7407	267	644	11670
1996-97	3418	7746	317	713	11893
1997-98	3167	7030	453	985	9192
1998-99	3757	8814	315	753	15055
1999-00	4422	9713	378	823	13157
2000-01	4874	11919	355	875	16725

Source: Cost of Cultivation of Principal Crops in India (Feb. 2000) by MoA, GoI, New Delhi.

The data in this above table makes it clear that the cost of cultivation has increased at a higher rate as compared to the rate of increase in gross returns from rapeseed and mustard in Rajasthan. While the cost of cultivation has increased by 60%, the gross returns has increased by 43% only. It is worth pointing out that the domestic prices of rapeseed and mustard seed has not been in commensuration with the increase in cost of cultivation during this period, even when the yield has been increasing at a rate around 4%/ annum. The availability of cheaper imported substitutes seem to have adversely affected the domestic demand of rapeseed and mustard oil.



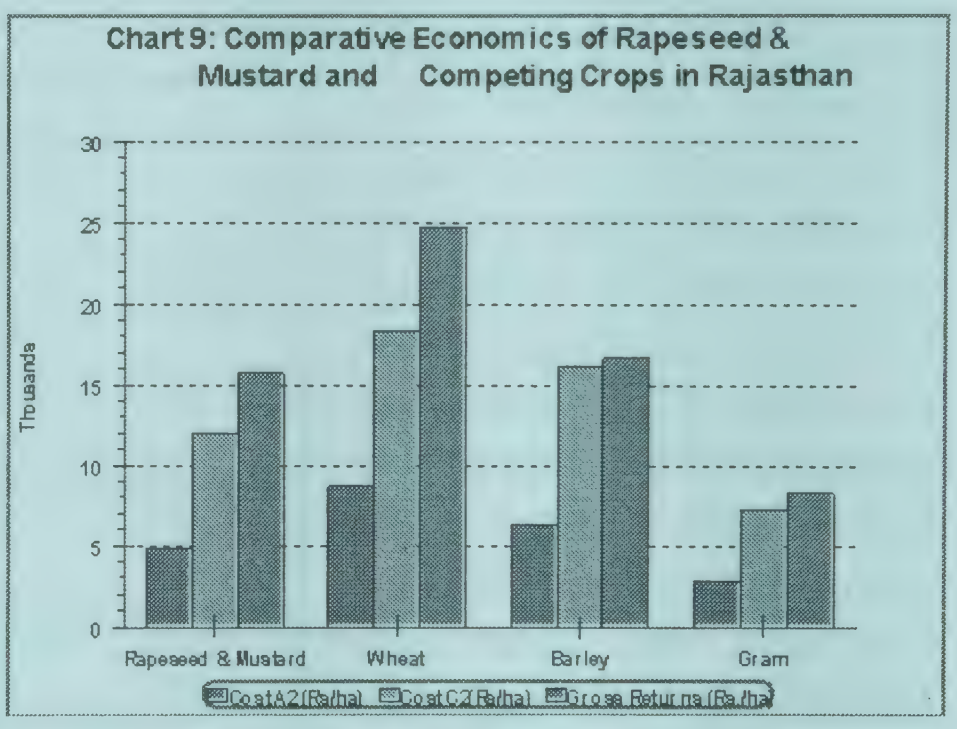
4.3 Comparative Economics of Rapeseed and Mustard with Competing Crops

The comparative economics of rapeseed and mustard and its competing crops in terms of cost of cultivation, gross return and profit margin on unit area basis in Rajasthan is given in Table 18.

Table 18: Comparative Economics of Rapeseed & Mustard and Competing Crops in Rajasthan (1999-2000/2000-01)

Crop	Cost of cultivation (Rs./ha)		Gross Returns (Rs./ha)	Return over cost (Rs./ha)	
	Paid cost (Cost A2)	Total cost (Cost C2)		Paid cost (Cost A2)	Total cost (Cost C2)
Rapeseed & Mustard	4874	11920	15719	10845	3799
Wheat	8694	18308	24679	15985	6371
Barley	6260	16142	16673	10413	531
Gram	2807	7315	8283	5476	968

Source: Cost of Cultivation of Principal Crops in India (Feb. 2000) by MoA, GoI, New Delhi



Among the rabi crops, wheat is the most profitable crop in Rajasthan, both in terms of net gain and joint return over land, family labour and capital investment. Wheat serves the food security of the people and fodder requirement of animals. Still rapeseed and mustard is grown under commendable area due to low requirement of short term capital (Cost A2). Besides, the water requirement of rapeseed and mustard is much less than that of wheat. Rapeseed and mustard is next to wheat with respect to return over cost of cultivation. Rapeseed and mustard being a cash crop of small, marginal and other resource constrained farmers of the state, any set back to this crop will adversely effect the rural prosperity and livelihood system of the state.

5. PROCESSORS' PERCEPTION

During the post WTO period, the mustard processing industries are facing a series of problems. There are more than 300 crushing units for rapeseed and mustard in the state in addition to a large number of traditional household level crushing units (*Ghanis*). All these units are struggling for survival.

Some of the issues/problems cited by them include:

(i) Against the cost of production of Rs. 4300 per quintal, the market price of mustard oil is only Rs. 4100/quintal and hence the processors incur a loss of Rs. 2/kg mustard oil.

(ii) The higher price range for mustard oil (Rs.4100/qtl) as compared to soya oil (Rs.3420/qtl) and palm oil (Rs. 3380/qtl) has reduced the domestic demand for mustard oil considerably.

(iii) The lower prices of imported oil under OGL paves way to adulterate and guising domestically produced coconut oil, groundnut oil, deshi ghee and vanaspati ghee.

(iv) The MSP for oil seed and OGL for edible oil lead to a situation wherein the oilseeds produced in our country and procured under MSP are lying in godowns due to diseconomy of its processing.

(v) The ways and means being suggested by mustard traders to compete with importers and to overcome current problems include :

- Steps to increase productivity of mustard seed in order to have cost effectiveness.
- Mechanism to purchase mustard seed by the processors directly from producer farmers which in turn will help to reduce cost of production of oilseed as 3% tax will be exempted.
- The mandi tax of 1.6% also be exempted for SSI units.

5.1 Processing Costs and Margins for Rapeseed and Mustard in Rajasthan (2003-04):

The 'back of envelope' calculations to assess the processing costs and margins for rapeseed and mustard for the year 2003-04 are as under:

1. The average wholesale price for rapeseed and mustard = Rs. 1757/qtl.
   (Average from April 2003 to March 2004)
2. Average wholesale price for rapeseed and mustard oil = Rs. 54/kg.
   (Average from January 2004 to December 2004)

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3.	Average wholesale price for rapeseed and mustard cake	=	Rs. 4.9 /kg.
4.	The moisture content of the seed	=	8.5%
5.	100 kg seed produces 28.37 kg oil and 63.13 kg cake and has 8.5 kg moisture.		
6.	Revenue from oil obtained from 100 kg	=	28.37x54
	rapeseed and mustard seed	=	1531.98
7.	Revenue from cake obtained from 100 kg rapeseed	=	63.13x4.9
	and mustard seed	=	309.34
8.	Gross revenue from oil and cake	=	1841.32
9.	Processing margin	=	1841-1757
		=	Rs. 84/qtl.
		=	Rs. 840/ton
10.	Rate of processing margin	=	84/1757x100
		=	4.78%

(Source of these data : Directorate of Agricultural Marketing, 2003-04; The Economic Times, Jan. to Dec. 2004)

The rate of return to the processors at the rate of 4.8% is by all means a small rate. Normally, under such conditions, processors trend to adopt undesirable practices which may have adverse implication on the consumers. It is not only the farmers but the processors who invested large money to install processing plants but have become the victims of AoA of WTO in Rajasthan.

6. EMPLOYMENT PROSPECT FOR RAPESEED AND MUSTARD

Rapeseed and mustard being a commercial crop has employment prospects for pre and post-harvest operations. The average employment requirement (1995-98) for the production of rapeseed and mustard at farm level comes around 334 hrs./ha or 41.7 man days/ha. The labour requirement for processing activities at modern solvent plant is on an average one worker/metric ton of seed per day. The state level employment opportunities estimated for production and processing of rapeseed and mustard is as under:

(a) **Production** (based on cost of cultivation data)

(i) Area under rapeseed	:	2062722 ha
(ii) Man days of employment	:	86.02 million man days

(b)	**Processing** (based on processors perception)		
	(i) Production of rapeseed	:	3857262 metric tons
	(ii) Man days of employment	:	3.86 million man days
(c)	**Total employment for production and processing of rapeseed and mustard**	:	89.88 million man days

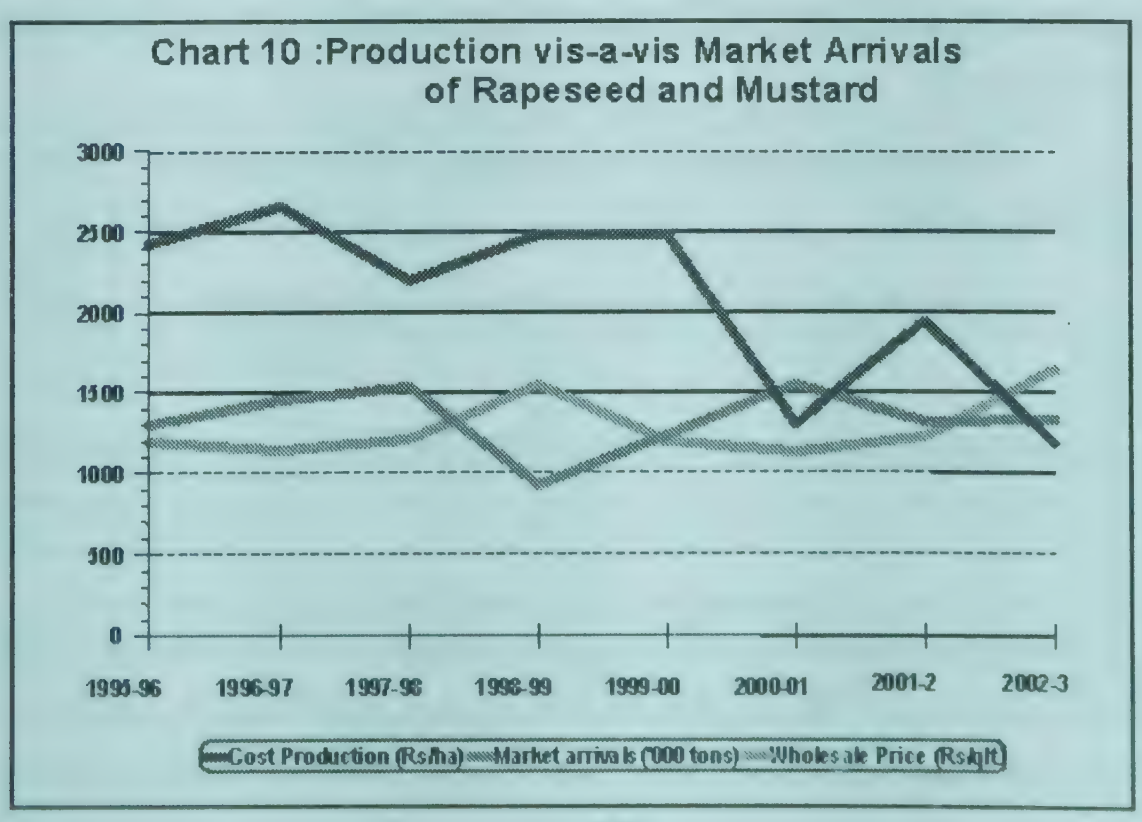
Besides, secondary sources of employment opportunities for work related to transport, storage, distribution, etc. of rapeseed and mustard and its products create additional employment.

In other words, every hectare of rapeseed and mustard will generate employment opportunities to the extent of 41.7 man days for production and 1.12 man days for processing in addition to the secondary sources of employment for transport, storage, distribution, etc.

The reduction in area as well as production of rapeseed and mustard in the state during the post WTO period is adversely affecting the rural employment scenario of the state. It may be one of the reasons for the emergence of large number of marginal workers, specially female workers.

7. MARKETING AND PRICES OF RAPESEED AND MUSTARD IN RAJASTHAN

The major markets for rapeseed and mustard in Rajashtan include Deoli, Malpura, Niwai, Tonk, Uniara, Alwar, Khertal, Khetri, Bayana, Bharatpur, Deeg, Nandwai, Bikaner, Hanumangarh, Sadulshahar, Surajgarh, Lalsoth, Jodhpur, Baran, Chhabra, Bundi, Hindon, Kota, Bhawani Mandi, Ramganj Mandi, Medta City, Nagaur, Sikar, Sriganganagar, Gharsana, Anoopgarh, Padampur, etc.



The total market arrivals of rapeseed and mustard along with the production of corresponding years are depicted in Table 19 for the post WTO period.

Table 19: Production vis-à-vis Market Arrivals of Rapeseed and Mustard in Rajasthan

Year	Production ('000 tons)	Market arrivals ('000 tons)	Market arrivals as % of production	Wholesale price (Rs./qtl.)
1995-96	2420	1297.79	53.63	1196
1996-97	2660	1457.46	54.79	1146
1997-98	2190	1526.13	69.67	1213
1998-99	2480	918.77	37.05	1550
1999-00	2480	1236.84	49.87	1190
2000-01	1310	1544.01	117.86	1133
2001-02	1940	1311.20	67.59	1224
2002-03	1178	1334.25	113.26	1640

Source: Directorate of Agriculture and Marketing, GoR, Jaipur.

The data in this table reveal that more than half of the production is sold in the regulated market every year (except in the year 1998-99 even when the wholesale price was higher, may be due to dropsy problem which prevailed at that time). The remaining part of the production seems to be used by the local crushers using traditional technologies. The table also shows market arrival of more than 100% in some of the years. This may be due to the fact that (a) production is recorded according to agriculture year i.e. July to June and market arrival is recorded according to marketing year i.e. November to October (b) the prices seem to affect the market arrivals.

The comparison of cost of production with domestic prices are given in Table 20.

Table 20: Comparison of Cost of Production and Domestic Prices of Rapeseed and Mustard

Year	Cost of production (Rs./qtl.)	Farm harvest price (Rs./qtl.)	Wholesale price (Rs./qtl.)	Minimum support price (Rs./qtl.)	International price Rotterdam (Rs./qtl.)
1995-96	644	1015	1196	860	1045
1996-97	713	1095	1146	890	1016
1997-98	985	1289	1213	940	1183
1998-99	753	1287	1550	1000	971
1999-00	823	1115	1190	1100	839
2000-01	875	1157	1133	1200	946
2001-02	819	1190	1224	1300	1067

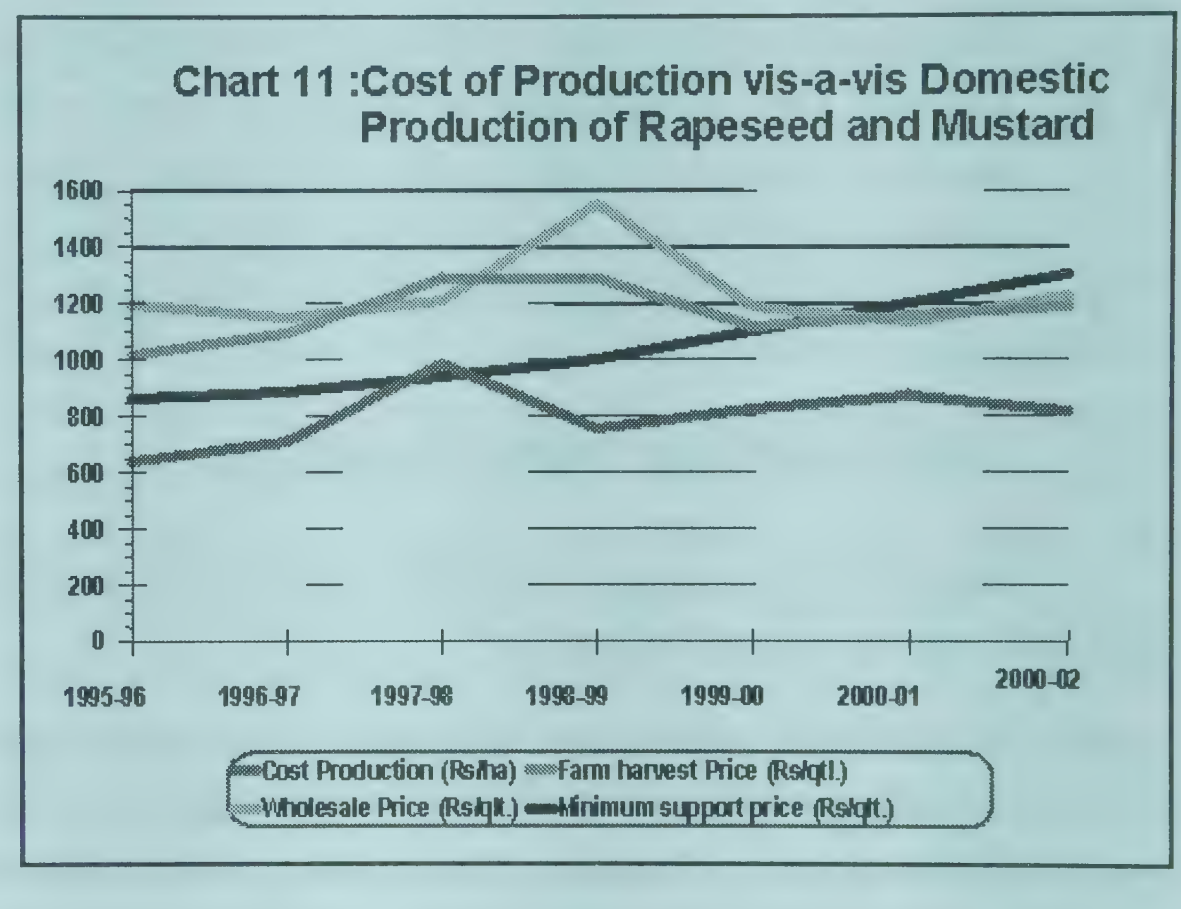
Sources : (i) Commission for Agricultural Costs and Prices, 2004, Reports of the Commission for

Agricultural Costs and Prices for the Crops Sown during 2003-04 season, New Delhi;

(ii) Directorate of Agriculture Marketing, 2003-04, Statement of Yearly Average Prices of Agricultural Commodities, GoR, Jaipur;

(iii) Ministry of Agriculture, 2004, Agriculture Statistics at a Glance, New Delhi; (iv) United States Department of Agriculture, 2005, Production Supply and Distribution Official Statistics.

It is evident from the table that the MSP of rapeseed and mustard has increased at a faster rate indicating the concern of GoI to protect the interest of rapeseed and mustard growers. The scanning of FHP and WSP with MSP revealed that the FHP and WSP were higher over MSP till 1999-00. Since then the FHP and WSP were less than MSP indicating that the external factors including the import of cheap edible oil could not make it possible for these prices to be at par with MSP. The emerging scenario is not at all healthy for the sustainable production of rapeseed and mustard in a state like Rajasthan which has revealed preference for rapeseed and mustard crop. Remarkably the international price of rapeseed and mustard seed during this period remained below the domestic prices of this crop. However, due to the higher tariff rate of mustard oil in comparison to soya oil restricted the import of mustard oil otherwise the situation would have been worsen for the rapeseed and mustard growers of the state. Unless the import of cheap edible oil (palm oil) is restricted, it will be a tedious task to increase the domestic demand of rapeseed and mustard oil without which the distortive price situation cannot be reversed.



8. FARMERS' PERCEPTION ON RAPESEED AND MUSTARD CULTIVATION

Discussions were held with rapeseed and mustard growers in the villages of Panhori (Deeg, Bharatpur) and Gwalda (Tijara, Alwar). Some of their

perceptions are summarized below:

- Rapeseed and mustard cultivation is not attractive now as it was earlier.
- Being irrigated crop, the hike in the prices of diesel, electricity, fertilizer has caused to increase the cost of cultivation tremendously.
- Demand from local crushing unit is decreasing day by day and so are not getting remunerative prices for their produce.
- Continue the cultivation of rapeseed and mustard keeping in view the declared MSP but fail to dispose off produce at MSP since the market conditions are not fair.
- At the time of harvest farmers are forced to sell at price level below MSP.
- Under MSP procurement, quite often reductions are made on the pretext of low quality produce.
- Dropsy problems reported 3 to 4 years back has acted as a set back for the steady growth in area under rapeseed and mustard.
- Though the profitability of wheat is more with ensured food and fodder security, rapeseed and mustard is grown since it requires less water and capital and there is no other alternative to rapeseed and mustard growing.
- The profitability of rapeseed and mustard cultivation has reduced over time.

9. SUMMARY OF IMPLICATIONS

Some of the issues related to rapeseed and mustard under post WTO regime is summarized as under:

- Rapeseed and mustard is the most important rabi oilseed crop of Rajasthan covering about 20 to 30 lac hectare area every year which is about 24 to 39% of rabi cropped area of the state. There are about 55 to 60 lac growers of this crop in the state. Rajasthan has earned the title the "Mustard State" of the country by sharing about 35% production in the country and more than 5% production of rapeseed and mustard in the world. The productivity of rapeseed and mustard is growing at rate of 3.9% and the yield gap of the state with global yield is not very high.
- The production of rapeseed and mustard is decelerating at the compound growth rate of 4.17% per annum despite positive growth in productivity (3.91% per annum) due to decline in area by 7.8 % per annum).
- Though rapeseed and mustard is a farmer friendly crop with respect to low cost of production and less water requirement, the share of rapeseed and mustard area to total rabi cropped area has come down from 38% in 1995-96 to 24% in 2002-03.

- The operational cost of cultivation of rapeseed and mustard has increased by more than 6% annually due to increase in the cost of machine labour, fertilizer, irrigation, etc. which is attributable to the hike in the prices of diesel and electricity as a follow up action of agreement under WTO.
- The cost of cultivation of rapeseed and mustard has been increasing at a faster rate as compared to gross returns from this crop.
- The lower prices of imported oil under OGL paves way for adulteration / guising of domestically produced high cost oils including rapeseed and mustard.
- The import of edible oil under OGL leads to the procured oilseed at MSP to be in godown for long periods due to diseconomy in its processing which is accelerating the problem of unemployment in rural areas.
- The processing margin is not remunerative for processors to continue the processing activity.
- The wholesale price and farm harvest prices of rapeseed and mustard has fallen below the MSP due to import of cheap edible oil which limits the domestic demand for rapeseed and mustard oil.

With the increasing demand for agricultural commodities, specially when it is income elastic, a country like India must explore the domestic potentials to meet the same. On one hand it will lead to more employment opportunities in farm sector and on the other hand the ensured market for output will act as an incentive for accelerated investment in agriculture. For commodities like oilseed, which have spillover opportunities for processing, distribution, etc. the scope for increased employment is much higher. One should resort for import as an option when domestic opportunities are unaccessable. The Indian oilseed production which remained stagnant below 12 million tons during the post green revolution period, picked up fast as a result of oilseed mission programmes launched during the later part of eighties. The production of oilseed did show responsiveness to price policy and technological support devised in the country. The less developed states like Rajasthan, Madhya Pradesh, etc. responded quickly to these incentives. The fast growing import of edible oil would hit badly those states whose agricultural economy is dependent largely on oilseed.

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SECTION-C
(Economic Status and Impact Assessment on Soybean)

ABSTRACT

Trade in Agriculture and trade in Services found place in the General Agreement on Tariffs and Trade (GATT) negotiation for the first time during the eighth round of negotiation which is popularly known as "Uruguay Round". The implementation of Agreement on Agriculture signed under WTO has posed problems for both developed and developing countries. The Agreement on Agriculture concentrates on liberalization in the areas of market access, domestic support and export competition. The liberalized agricultural trade policy adopted as per the requirements of AoA has set the national oilseed economy off balance.

The countries like US, Brazil, Argentina, China and India are the largest producers of oilseeds in the world. While, US, China, Brazil and India are the largest vegetable oil economics in the world, Malaysia and Indonesia are the largest producers of palm oil. Though, India and China are the largest consumers of vegetable oil in the world, their per capita consumption is very low. US, Brazil, Argentina and EU account for over 80% of world oilseed exports. Though the world oilseed trade is not much restricted, various trade distorting policies are being practiced by different countries for oils and deoiled-cakes. Since the inception of WTO, world oil prices have been fluctuating and have reached a record low in 2000-01 and hit a 10 year high in 2003-04.

India ranks 5th in the production of oilseeds next to US, China, Brazil and Argentina. Groundnut, soybean and rapeseed and mustard together account for more than 80% of aggregate oilseed output. Indian oilseed sector is characterized by fluctuating outputs, low yields and depressed farm gate prices. Though India is amongst the largest consumers of vegetable oil, the per capita consumption is as low as 10.5 kg/person/year. The consumption pattern is highly skewed and characterized by strong regional preferences for oil with natural flavour. However, Indian consumers are highly sensitive to price changes which can be seen from the fact that palm oil consumption has increased from less than 4% during early 70's to about 38% of total edible oils in the beginning of this decade. Since the edible oil import were put under the Open General License (OGL), the import of vegetable oils has increased from less than 1 million tons in 1992-93 to more than 4 million tons during the current decade.

Oilseeds are grown in both kharif and rabi season in Rajasthan and account for about 15% of gross cropped area of the state. About 35% of total

oilseed area in the state is in kharif and the remaining 65% of oilseed area is in rabi season. With the population of the state increasing at a faster rate (28.33%), than that at the national level (21.34%) during 1991-2001 and with the increase in marginal workers by 99% during this period, it is warranted to have greater employment opportunities to secure the livelihood of this increasing population. Considering the labour intensity of oilseed production and processing, it seems to be a promising activity to accommodate the increasing workforce in different regions of the state.

Soybean accounts for about 56% of world oilseed, 69% of world oil cake and 29% of world vegetable oil production. US, Brazil, Argentina and China are the largest soybean producers. India accounts for more than 7% of world area under soybean. However, due to low productivity, India accounts for only 4% of world soybean production. Madhya Pradesh, Maharashtra and Rajasthan are the major soybean producing states. India exports substantial quantity of deoiled soybean cake. However, the exports have shown a decelerating trend over the years since the inception of WTO. Soybean oil imports have shown tremendous growth since the opening up of oilseed trade wherein oil imports were put under OGL. The low bound rate of soybean oil imports (45%) and lowering of price gap between soybean oil and palm oil were also major contributing factors to have high soybean oil imports.

Soybean cultivation is a recent introduction in Rajasthan, after the launching of technical mission on oilseeds. Soybean is grown in the south-eastern part of the state. It is grown under rainfed condition mainly by resource constrained small and marginal farmers. Soybean cultivation in Rajasthan is characterized by:

(i) Increasing area under soybean inspite of stagnant production and decelerating yield.

(ii) Increasing share of soybean area in relation to kharif cropped area.

(iii) Increasing rate of variable costs (due to increase in prices of inputs in post-WTO regime) in relation to fixed cost.

(iv) Better performance of soybean in terms of net returns as compared to competing crops like maize and jowar.

(v) Low processing margins during post WTO period.

(vi) The viability of soybean processing depends on recovery and price of soybean oil and quality and price of deoiled cake. However, in post WTO regime the demand and price of DOC has gone down considerably posing a threat to soybean cultivation. Every hectare of soybean generates employment opportunities to the extent of 43.7 man days for production and 1.42 man days for processing in addition to

secondary sources of employment for transport storage, distribution, etc. Any set back in area under soybean directly pose problem to the employment prospects in soybean producing area as there is no economically viable substitute for soybean.

(vii) The minimum support price of soybean has not been playing a crucial role in determining the wholesale prices as well as farm harvest prices.

(viii) The WSP and FHP seem to be more influenced by global supply and international price of oils/oilseeds.

In view of the above facts, it is evident that the OGL for edible oils which was allowed to protect the interest of the consumers may pose threat to soybean cultivation which is getting adversely affected by the import of cheap soybean and palm oil. In India, while the oilseed prices are determined in the domestic market, the oil prices are influenced by the international prices. Low international prices of oils cause depressed oilseed supply since the imbalance between domestic and international market reflects on growers. Hence procurement of soybean under MSP may not be a viable option in long run. Besides, soybean price depends on the price of soybean cake and oil. The change in China's oilseed policy in the post WTO regime has also posed threat to soybean cultivation in India in general and Rajasthan in particular because of the lowering of demand for DOC.

Though soybean is a crop of recent introduction in the state, its fast growth in area and production attracted many processors who with great hope installed number of processing units in the state including those under co-operative sector. However, because of cheap imports of soybean and palm oil, the domestically processed oils and cakes could not fetch adequate prices to keep running the processing plants installed in the state. As a result, number of processing plants are non-functional currently which in turn may pose problems for sustainable soybean production in the state. Though currently only processors are the directly affected victims of liberalized trade of oilseeds, in the near future, the grower farmers may also find it difficult to sustain the production in the liberalized trade regime.

The cost effectiveness for producer farmers for stability and growth of yield by appropriate technological intervention, efficient processing by ensured capacity utilization and such import policy of edible oils which may not distort the market price of soybean oil and cake, only can ensure that the major stake holders namely producer farmers, processors and consumers of soybean are well protected so as to sustain the production of soybean in the state.

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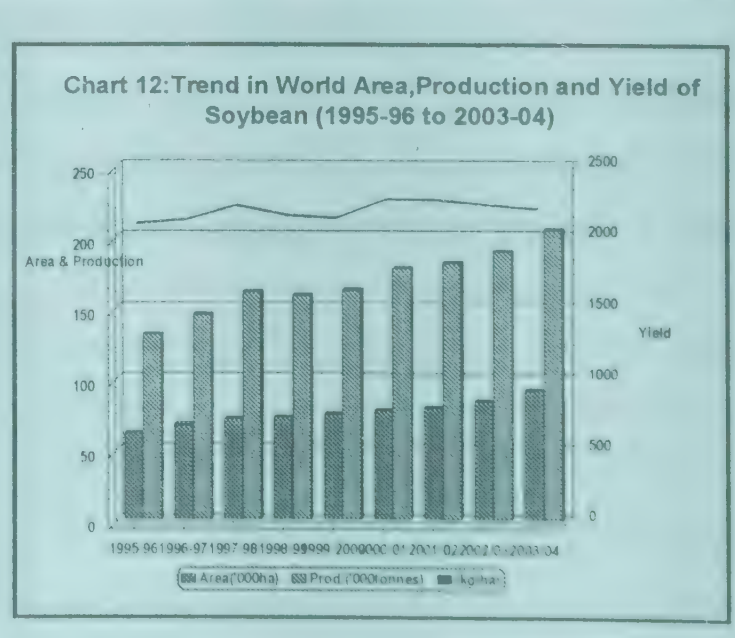
1. WORLD PRODUCTION OF SOYBEAN

Soybean is the largest produced oilseed in the world. Of the oilseed (all) production of 380 million tons (2004), (United States Department of Agriculture, 2005), soybean production alone stands at 214.4 million tons contributing to over 56% of global oilseed production. Soybean is grown in more than 91 million hectare area in different countries of the world. The annual world production of soybean has exceeded 200 million tons in 2003-04 from 130 million tons in 1995-96. The area under soybean has increased from 61 million hectares to 91 million hectares during this period. The yield of soybean ranged between 21 to 23 quintal per hectare. US with the annual production of 66 million tons is the largest producer of soybean in the world, followed by Brazil (52 million tons), Argentina (35 million tons), China (16.5 million tons). (Food and Agricultural Organization of the United Nations, 2004). The trend as well as compound growth rates (CGR) of world area, production and productivity of soybean during the period 1995-96 to 2003-04 are given in Table 21.

Table 21 : Soybean Production in World during 1995-96 to 2003-04

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	61093	130213	2131
1996-97	66954	144416	2157
1997-98	70970	160101	2256
1998-99	72106	157802	2189
1999-00	74400	161405	2169
2000-01	76834	176761	2301
2001-02	78831	180907	2295
2002-03	83496	188930	2263
2003-04	91433	204266	2234
CGR (%/annum)	**4.34**	**5.07**	**0.70**

Source: FAOSTAT – Agriculture



It is evident that the world production of soybean has been increasing largely due to increase in area under soybean. The major soybean producing countries like US, Brazil and Argentina made use of the market access clause to export soybean oil to major importing countries like China, India, etc. Incidentally these exporting countries have the

definite advantage of cost effectiveness due to higher productivity.

1.1 Soybean Oil:

The share of soybean oil in the total vegetable oil production in the world for the last five years is given in Table 22.

Table 22 : Share of Soybean Oil in Total Vegetable Oil in the World

Year	Total vegetable oil (Million tons)		Soybean oil (Million tons)		Share (%)	
	World	India	World	India	World	India
2000	90.03	6.02	26.70	0.64	29.66	10.63
2001	92.88	5.49	28.88	0.48	31.11	8.74
2002	95.80	6.20	30.47	0.53	31.80	8.54
2003	101.67	4.89	29.91	0.39	29.42	7.98

Source: FAOSTAT – Agriculture.

The share of soybean oil in total vegetable oil production in the world is consistent around 30%.

1.2 Soybean Meals:

During 2004, the total protein meal production at global level was 204.07 million tons out of which 198.61 million tons was through oilseed sources. Soybean alone accounted for 67% of the major protein meals produced in the world. Almost the entire meal produced was consumed. The world consumption of protein meal has increased by 16% during the period 2000 to 2004 indicating the high demand for protein meal and consequently the high demand for soybean meal at global level. (United States Department of Agriculture, 2005).

The contribution of soybean seed, cake and oil in the world production of total oilseed, oilcake and vegetable oil could be seen from Table 23. Soybean accounts for 56.32% of total oilseed 69.32% of world oil cake production and 29.17% of total vegetable oil production in the world.

Table 23. Production of Soybean Seed/Cake/Oil vis-à-vis Other Oilseeds in World (2004)

Type of oil seed	Seed (Million tons)	Oil cake (Million tons)	Oil (Million tons)	Oil Production of India 2002-03 (Million tons)
Copra	5.39	1.69	3.30	NA
Cottonseed	45.55	14.77	4.77	0.30
Palm Kernel	9.29	4.83	37.19	NA
Peanut	33.14	5.73	4.91	1.06
Rapeseed	46.52	24.12	15.83	1.39
Soybean	**214.43**	**137.69**	**32.04**	**0.39**
Sunflower	25.77	9.76	9.06	0.30
Others	-	-	2.74	0.17
Total	**380.07**	**198.61**	**109.82**	**3.61**

Source: FAOSTAT – Agriculture.

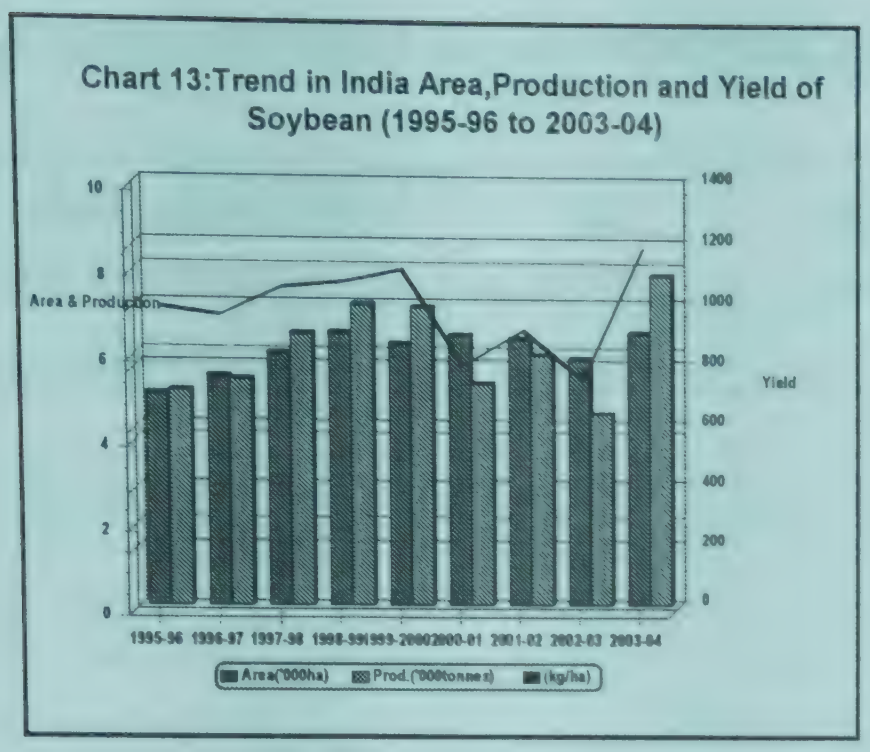
2. SOYBEAN PRODUCTION IN INDIA

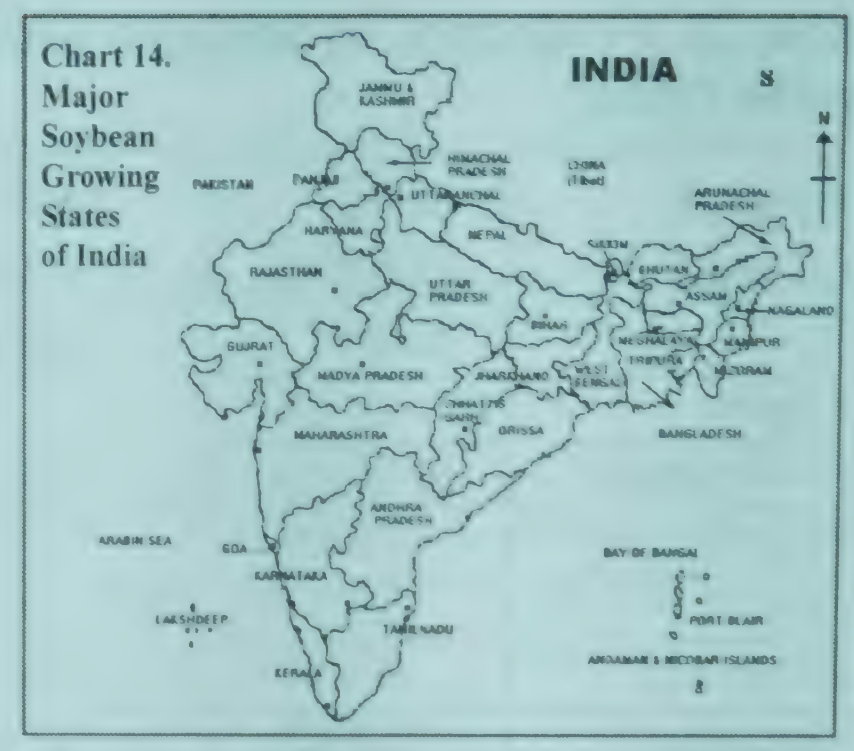
With the production of 7.8 million tons, India is the fifth largest producer of soybean in the world (Food and Agricultural Organization of the United Nations, 2004). Though the area share is more than 7%, India's contribution in the world production of soybean is only 4%. Remarkably, the productivity level of soybean in India is only half of that of world average. The trend and growth rates of area, production and yield of soybean in India for the period 1995-96 to 2003-04 is given in Table 24.

Table 24: Trend and Compound Growth Rate of Soybean Production in India (1995-96 to 2003-04)

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	5040	5100	1012
1996-97	5450	5380	987
1997-98	5990	6460	1079
1998-99	6490	7140	1100
1999-00	6220	7080	1138
2000-01	6420	5280	822
2001-02	6340	5960	940
2002-03	5870	4560	777
2003-04	6500	7850	1208
CGR (%/annum)	**2.26**	**1.29**	**-0.96**

Source: Agricultural Statistics at a Glance, MoA, GoI, New Delhi.





Despite 2.26% growth in area under soybean, the production growth remained at 1.29% due to negative growth by almost 1% in yield of soybean in India during the period 1995-96 to 2003-04. The low yield level coupled with negative growth rate in yield of soybean in the country is a matter of concern. Unless the yield level is improved, the cost effectiveness of soybean production may not be possible for the sustainable production of soybean in the globalized regime in the country. India's share in world area and production of soybean is given in table 25.

Table 25: India's Share in World Area and Production of Soybean (1995-96 to 2003-04)

Year	Area (%)	Production (%)
1995-96	8.25	3.92
1996-97	8.14	3.73
1997-98	8.44	4.03
1998-99	9.00	4.52
1999-2000	8.36	4.39
2000-01	8.36	2.99
2001-02	8.04	3.29
2002-03	7.03	2.41
2003-04	7.11	3.84

India's share in world area under soybean has been declining since 2000-01 whereas India's share in world production of soybean has been fluctuating indicating high variations in yield during this period.

The production of soybean in India is concentrated in the states of Madhya Pradesh (61%), Maharashtra (27%) and Rajasthan (9%). The share of area and production of soybean in different states of the country is given in Table 26.

Table 26 : Major Soybean Producing States in India

Major producing states	Average for three years (ending 1997-98)				Average for three years (ending 2002-03)			
	Area (Million ha)	Share (%)	Prod. (Million tons)	Share (%)	Area (Million ha)	Share (%)	Prod. (Million tons)	Share (%)
M. P.	4.03	75.19	4.19	74.69	4.25	68.88	3.21	61.38
Maharashtra	0.73	13.62	0.82	14.62	1.17	18.96	1.41	26.96
Rajasthan	0.47	8.77	0.49	8.73	0.6	9.72	0.47	8.99
Karnataka	0.05	0.93	0.04	0.71	0.06	0.97	0.05	0.96
A.P.	NA	-	NA	-	0.02	0.32	0.02	0.38
Others	0.08	1.49	0.07	1.24	0.07	1.13	0.06	1.15
India	**5.36**	**100**	**5.61**	**100**	**6.17**	**100**	**5.23**	**100**

Source: Agricultural Statistics at a Glance, MoA, GoI, New Delhi.

3. SOYBEAN TRADE SCENARIO

Soybean is the most traded oilseed in the world. The details of export and import of soybean and its derivatives by India during 1995-96 to 2003-04 are given in Table 27.

Table 27 : The Details of Soybean and its Derivatives by India

Year	Seed import		Seed export		Cake export		Oil import	
	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)	Qty (Mt.)	Value (1000$)
1995-96	29453	7801	65	29	2591803	567182	101485	72060
1996-97	0	0	1299	335	2981749	764744	21363	14254
1997-98	97	26	11469	3249	2871569	733937	45737	33812
1998-99	33600	12000	1327	214	2830800	415571	439625	299721
1999-00	0	0	9828	1708	2400048	367041	609825	283931
2000-01	132	68	75020	15946	2256502	438614	582984	201281
2001-02	57	20	5805	1190	2383371	459238	1357919	506187
2002-03	1	1	1716	391	1440805	274796	1196535	540146
2003-04	1	1	242273	62186	2749268	653689	993498	565440
CGR (%/annum)	-	-	-	-	**(-)4.15**	**(-)5.48**	**60.17**	**49.58**

Source: FAOSTAT – Agriculture

Barring one or two years (1995-96 and 1998-99) there has been no substantial soybean seed import. Soybean trade by India is confined to limited quantity of seed export, export of substantial quantity of deoiled cake and import of soybean oil. However, the volume of oil cake exported over the years has

decelerated both in terms of physical quantity and value. On the other hand, the volume of oil import both in terms of physical quantity and value accelerated at a fast rate of 60.2% and 49.6%, respectively. The decline in export earnings through oilcake is stated as due to the presence of anti-nutritional factors and contaminates in oilseed cakes and meals (Kumar and Jha, 2004). Another factor for the decline in the export of deoiled soybean cake from India is the entry of China into WTO and their policy of importing soybean seed for crushing within the country to meet their oil and oilseed cake demand. This can be observed from the fact that China's imports of soybean cake reduced from 1,902,491 tons in 1996 to 42,807 tons in 2003. Continuously declining trend in China's import of soybean cake can be seen from table 28.

Table 28 : Import of Soybean Cake by China (1995-2003)

Year	Quantity (tons)	Value (1000 $)
1995	43930	9313
1996	1902491	526653
1997	3478205	982964
1998	3734669	864132
1999	609211	107304
2000	565017	117690
2001	99547	23313
2002	18340	3970
2003	42807	10561

Source: FAOSTAT- Agriculture

Consequently, our soybean cake does not have easy market outlet for export. Similarly the high growth in the import of soybean oil is attributable to:

(i) the prevailing lowest bound rate and applied tariff rate of 45% as compared to higher rates for other oils.

(ii) the lowering of price gap between palm oil and soybean oil, the latter having revealed preference over palm oil by the general consumers of the country.

4. SOYBEAN PRODUCTION IN RAJASTHAN

Soybean is a kharif oilseed crop of latest introduction in the state after the launching of technological mission on oilseed for boosting edible oil production in the country. Soybean accounts for 17.67% of oilseed production in Rajasthan.

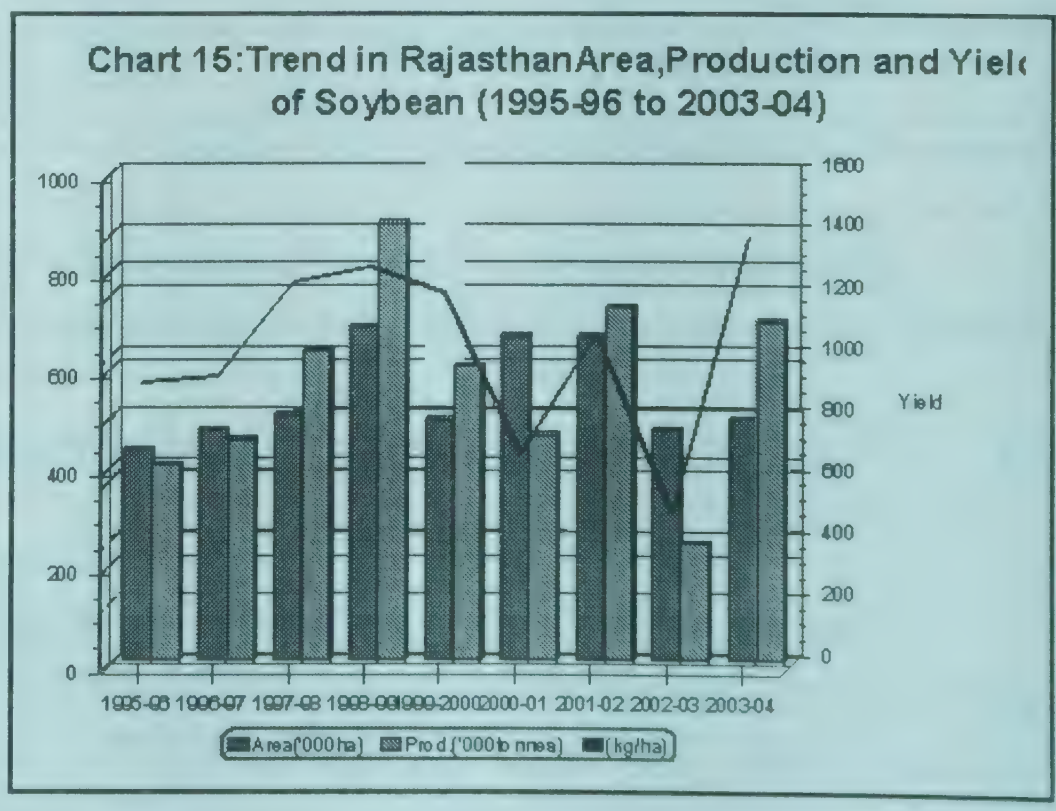
The soybean cultivation in the state is dominant in a contiguous belt of south eastern part comprising of Kota, Bundi, Jhalawar, Chittorgarh and Banswara. More than 99% of area under soybean is in this belt. The land holding distribution in this belt consists of about 36% marginal holdings and 25% small holdings. Hence this crop is mostly grown by the resource constrained small and marginal farmers. There are about 4.5 to 5 lac growers of this crop in the state. (Agricultural Census of Rajasthan, 1995-96). The temporal pattern along with growth rates in area, production and yield of soybean in Rajasthan could be seen from Table 29.

Table 29 : Area, Production and Yield of Soybean in Rajasthan

Year	Area ('000 ha)	Production ('000 tons)	Yield (kg/ha)
1995-96	430	400	930
1996-97	470	450	957
1997-98	500	630	1260
1998-99	680	890	1308
1999-00	490	600	1224
2000-01	660	460	696
2001-02	660	720	1090
2002-03	470	240	510
2003-04	493	691	1401
CGR (%/annum)	**1.80**	**-0.15**	**-1.92**

Source: Vital Agricultural Statistics, GoR, Jaipur.

The area under soybean ranged between 0.43 million hectare in 1995-96 to 0.68 million hectare in 1997-98. Though the area under soybean remained at 0.66 million hectare during 2001-02, the area declined to 0.47 million hectare in 2002-03 and 0.49 million hectare in 2003-04. The production of soybean



increased from 0.40 million tons in 1995-96 to 0.89 million tons in 1998-99. The lowest production of 0.24 million tons in 2002-03 was recorded due to acute drought condition in the state. The inter-year yield fluctuations in soybean is very high being a rainfed crop. The yield of soybean in the state ranged from 510kg/ha in 2002-03 and 1401 kg/ha in 2003-04. The production of soybean remained stagnant with almost no growth due to decelerated growth rate of 1.92% per annum in yield despite positive growth rate in area under soybean by 1.8% per annum.

In Rajasthan, soybean is largely produced in the districts of Kota, Baran, Bundi, Jhalawar, Banswara, Udaipur, Bhilwara and Chittore. Table 30 gives a five year average of area and production of soybean in these districts.

Table 30 : Major Soybean Producing Districts in Rajasthan.

Major producing districts	Average for five years (ending 2001-02)			
	Area (ha.)	Share (%)	Prod. (tons)	Share (%)
Kota	122785	20.56	150289	22.78
Baran	126057	21.11	138999	21.07
Bundi	37425	6.27	37444	5.68
Jhalawar	186808	31.28	193224	29.29
Banswara	9437	1.58	11236	1.70
Udaipur	968	0.16	1082	0.16
Bhilwara	1342	0.23	1575	0.24
Chittore	109812	18.39	122701	18.60
Others	2611	0.44	3058	0.46
Rajasthan	**597245**	**100**	**659608**	**100**

Source: Vital Agricultural Statistics, GoR, Jaipur

The districts Kota, Baran, Bundi, Jhalawar and Chittore account for 97% of both area under and production of soybean in Rajasthan.

4.1 Share of Soybean Area to Kharif Cropped Area of Soybean Growing Region:

The share of soybean area in relation to kharif cropped area of the growing belt given in Table 31 revealed that the share of soybean area has been increasing over the years except for 2002-03 which happened to be an acute drought year for the region as well as the state. The kharif cropped area has been

increasing over the years and soybean gets a favourable deal from the growers due to the economic advantage over competing crops.

Table 31: Share of Soybean Area in Relation to Kharif Cropped Area of Soybean Growing Belt

Year	Kharif cropped area ('000 ha)	Soybean area ('000 ha)	Share of soybean area (%)
1995-96	1144.87	430	37.56
1996-97	1280.90	470	36.69
1997-98	1280.20	500	39.06
1998-99	1396.30	680	48.72
1999-00	1179.50	490	41.54
2000-01	1411.63	660	46.75
2001-02	1457.75	660	45.27
2002-03	1377.63	470	34.12

Source: Vital Agricultural Statistics, GoR, Jaipur.

4.2 Cost of Production of Soybean in Rajasthan:

Table 32 : Break-up of Cost of Cultivation per Hectare of Soybean in Rajasthan (1995-96 and 2000-01)

Items	1995-96	2000-01
Operational Cost	**3535.48**	**4993.33**
Human Labour	1540.20	2003.22
Bullock Labour	536.81	653.72
Machine Labour	337.10	987.88
Seed	779.15	1035.08
Fertilizer & Manure	288.08	167.56
Fertilizer	259.55	-
Manure	28.53	-
Insecticides	-	11.77
Irrigation Charges	21.84	20.28
Int. on Working Capital	68.30	112.82
Fixed Cost	**2021.60**	**2181.12**
Rental Value of Owned Land	869.27	1225.30
Rent paid for Leased Land	467.38	384.42
Land Revenue, Cases and Taxes	14.41	8.11
Dep. on Implements and F. Building	61.44	147.40
Int. on Fixed Capital	609.10	415.87
Total cost	**5557.08**	**7174.45**

Source: Cost of cultivation of Principle Crops in India (Feb. 2000) by MoA, GoI, New Delhi and Report of Commission for Agriculture Costs and Prices.

The details of cost of cultivation of Soybean for the year 1995-96 and 2000-01 are given in Table 32.

During the period, the operational cost which includes human labour, bullock labour, machine labour, seed, fertilizer, insecticides, irrigation charges, etc, has increased by 41.2%. The fixed cost items which consist of rental value of land, depreciation and interest on fixed capital has increased by only 7.9%. As a result, total cost of cultivation of soybean has increased by 29.1%. The increase in cost items like human labour, bullock labour, machine labour, seed, insecticides, etc. is largely due to the increase in prices of these inputs.

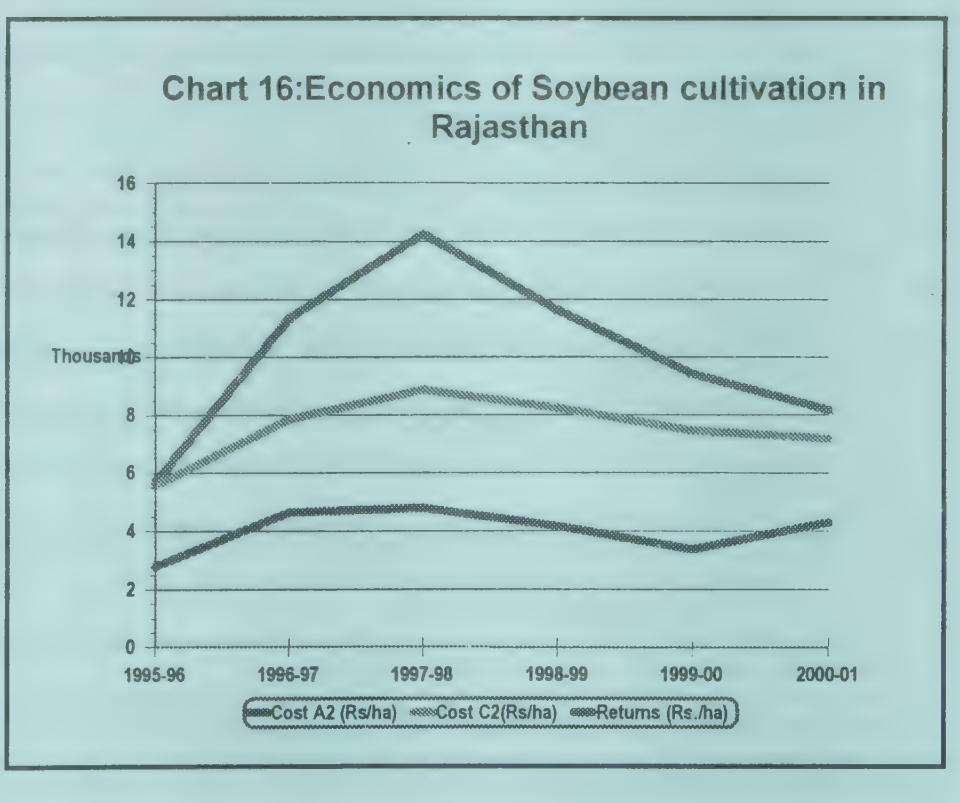
The details of cost and returns of soybean are given in Table 33.

Table 33 : Cost and Return of Soybean in Rajasthan

Year	Cost of cultivation (Rs./ha)		Cost of production (Rs./qtl.)		Gross return (Rs./ha)
	Cost A2 (Paid cost)	Cost C2 (Paid + imputed)	Cost A2 (Paid cost)	Cost C2 (Paid + imputed)	
1995-96	2797	5557	406	795	5676
1996-97	4648	7855	502	904	11367
1997-98	4808	8871	306	583	14237
1998-99	4151	8231	316	635	11625
1999-00	3365	7470	288	641	9419
2000-01	4296	7174	530	912	8176

Source : Cost of cultivation of Principle Crops in India (Feb. 2000) by MoA , GoI, New Delhi and Report of Commission for Agriculture Costs and Prices.

Wide fluctuations in cost as well as return from soybean is indicative of inconsistent economic behavior of this rainfed crop in south eastern Rajasthan. In fact, it appears that the soybean cultivation with fluctuating area is taken up by the small and marginal farmers in the absence of any economically viable alternative crops in the region.



4.3 Comparative Economics of Soybean with Competing Crops :

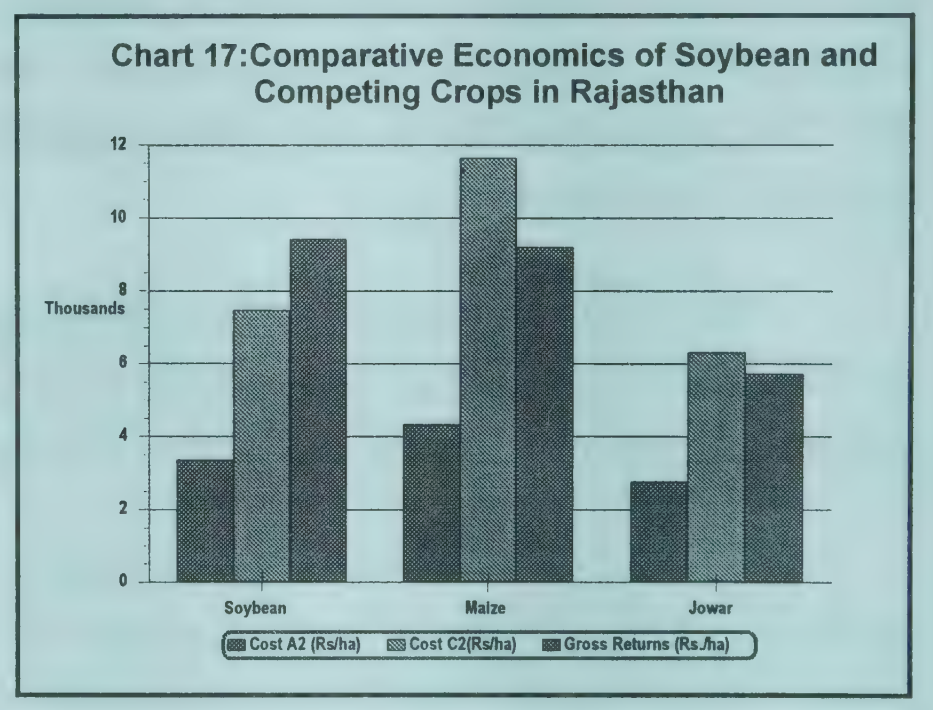
The comparative economics of soybean and its competing crops in terms of cost of cultivation, gross return and profit margin on unit area basis in Rajasthan is given in Table 34.

Table 34 : Comparative Economics of Soybean and Competing crops in Rajasthan.

Crop	Cost of Cultivation (Rs./ha.)		Gross return (Rs./ha)	Return over cost (Rs./ha.)	
	Paid cost (Cost A2)	Total Cost (Cost C2)		Paid cost (Cost A2)	Total Cost (Cost C2)
Soybean	3365	7470	9419	6054	1949
Maize	4331	11638	9202	4871	-2436
Jowar*	2766	6315	5729	2963	-538

** For 1995-96 for Kota district only.*

Source: Direction for Agricultural Policy Intervention for Sustainable Agricultural Development of Rajasthan by Dr. R.P. Singh and Dr. K.A. Varghese.



The soybean and its competing crops are mostly grown under rainfed condition. Soybean belt comprising of Jhalawar, Kota, Baran, Bundi and Chittorgarh fall in the humid/sub-humid region with fairly better rainfall pattern. The area expansion under soybean is confined to this belt only. The comparative economics of soybean in relation to other crops is still an incentive for the growers. Jowar and maize are the other important kharif crops of the soybean producing region. Jowar, which has lowest gross returns and return over paid cost, is generally replaced by soybean whereas maize area remained more or less static over the years. Though maize and soybean have more or less similar gross returns, maize is not an economically viable alternative for farmers due to :

(a) Production uncertainty of maize is very high. Lack of water during the critical stages can cause drastic reduction in maize yields.

(b) Maize production has high input cost.

(c) Maize has low returns over both paid and total cost as compared to soybean.

Therefore soybean has distinct advantage over other kharif crops.

5. PROCESSORS' PERCEPTION

The prospects of soybean depends on recovery of oil, quality of deoiled cake (DOC) and prices of both oil and cake. Till 1998, China has been the major buyer of soybean DOC from India. After China joined WTO, the demand for soybean DOC from India has been considerably reduced. China finds it more remunerative to import soybean seed and then process it for oil and cake using their own resources. Currently, major buyers of soybean DOC from India includes Korea, Singapore and Indonesia. These countries are not bulk buyers as compared to China.

Besides, soybean refined oil is available in the country at prices less than our cost of production. For example, when our cost of production has been Rs. 360 per 10 kg soya oil, the same is available at Kandla port at price level of Rs. 340 per 10 kg oil. Therefore, crushing of soya seed in our country is not competitive. Besides, the reduction of tariff made effective w.e.f. 16.9.05 from Rs. 558 per metric ton to Rs. 506 per metric ton has also gone against the interest of local processors.

The international prices of DOC which went up to Rs. 15500/- metric ton in 2002-03 due to fall in production of soybean has now come down to Rs. 9000 per metric ton due to fall in prices. (United States Department of Agriculture, 2005)

The MSP rate currently in vogue for soybean seed, the fall in prices of soybean DOC, the lower import prices of soybean oil as compared to our cost of production, etc. left the local processors with no other choice but to close down the units. Earning through export of soybean seed is also not going to be a feasible option due to high cost of production.

There were 42 registered solvent plants in the state as per report of Solvent Export Association of India. But currently only 4 are operating indicating the dismal state of these units established with high investment cost. Even the organization like *Tilam Sangh* (OILFED) under cooperative sector do not find it viable to run their plants in the state. The cost of production of soybean

oil being higher compared to global cost and the decelerating demand for deoiled cake of soybean by other countries, specially by China lead to such a situation.

The estimated capacity created for soybean extraction is only to cater the needs of 30% of state production. The non-functional situation of plants even under such a condition is a matter of great concern for investors.

5.1 Processing Costs and Margins for Soybean in Rajasthan (2003-04)

The details based on the back of 'envelope calculations' to assess the processing costs and margins for soybean for the year 2003-04 are as under:

1.	The average wholesale price for soybean seed (Average from April 2003 to March 2004)	=	Rs. 1406/ qtl.
2.	The average wholesale price for soybean oil (Average from January 2004 to December 2004)	=	Rs. 48.5/kg
3.	The average wholesale price for soybean cake (Average from January 2004 to December 2004)	=	Rs. 11.25/kg
4.	Moisture content	=	12%
5.	100 kg seed produces 14.08 kg oil and 73.92 kg cake (and 12 kg moisture content)		
6.	Revenue from oil obtained from 100 kg soybean seed	=	14.08x48.5
		=	Rs. 682.88
7.	Revenue from cake obtained from 100 kg soybean seed	=	73.92x11.25
		=	Rs. 831
8.	Gross revenue from oil and cake	=	Rs. 1514.48
9.	Processing margin	=	1514.48-1406
		=	Rs. 108.48/qtl.
		=	1085/ton

(Source of these data : Directorate of Agricultural Marketing, 2003-04; The Economic Times, Jan.-Dec. 2004).

The above calculation revealed the rate of processing margin of soybean comes around 7.7% which is not an exorbitant rate of return by any norms since it includes the losses and other unforeseen expenses. Whereas, in global market processing margin may be much higher due to low cost of production of soybean seed and higher processing efficiency. Besides, for developed countries the

modern and mechanized solvent extraction plants with higher capacity utilization will get the advantage of economics of scale of production also. The prevailing economics of processing coupled with the duties and taxes work as disincentives for the domestic processors.

6. EMPLOYMENT PROSPECTS OF SOYBEAN

Soybean being a commercial crop has employment prospects for pre and post-harvest operations. The average (1995-98) employment requirement for production of soybean in Rajasthan comes around 350 hrs./ha or 43.7 man days per hectare. The labour requirement for processing of soybean is on an average one worker /metric ton of seed per day.

The extent of employment for production and processing of soybean in the state for 2004-05 is as under:

(a)	**Production:** (Based on cost of cultivation data)		
	(i) Area under soybean	:	621897 (ha)
	(ii) Man days of employment	:	27.18 million man days
(b)	**Processing** (Based on processors perception)		
	(i) Production of soybean	:	886496 metric tons
	(ii) Man days of employment	:	0.88 million man days
(c)	**Total employment for production and processing of soybean**	:	28.06 million man day

Besides, secondary sources of employment opportunities for work related to transport, storage, distribution, etc. of soybean and its derivatives create additional employment opportunities.

In other words, every hectare of soybean generates employment opportunities to the extent of 43.7 man days for production and 1.42 man days for processing in addition to the secondary sources of employment for transport, storage, distribution, etc.

7. MARKETING AND PRICES OF SOYBEAN IN RAJASTHAN

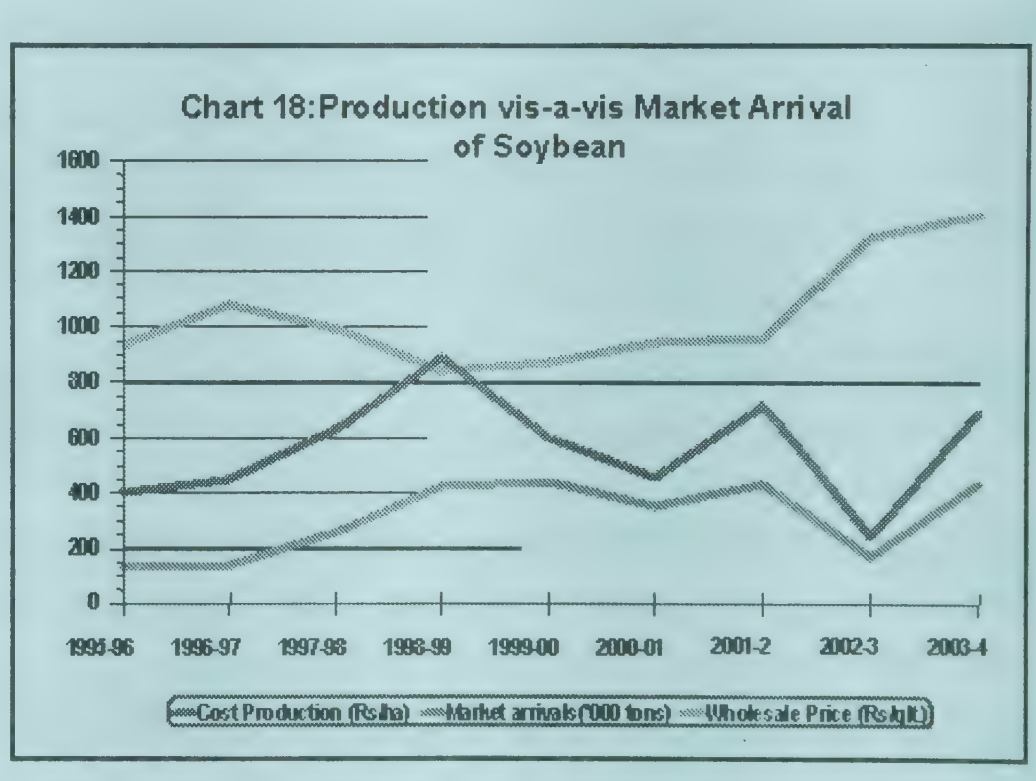
The major soybean marketing yards in the state include Anta, Atru, Baran, Bhawanimandi, Chhabra, Bundi, Keshavraipatan, Jhalarapatan, Aklera, Kota, Ramganjmandi, etc. The year wise market arrivals of soybean in the state along with the production for corresponding years are depicted in Table 35 for the period 1995-96 to 2003-04.

Table 35 : Production vis-à-vis Market Arrivals of Soybean in Rajasthan

Year	Production ('000 tons)	Market arrivals ('000 tons)	Market arrivals as % of production	Wholesale price (Rs./qtl.)
1995-96	400	133.64	33.41	935
1996-97	450	138.86	30.86	1084
1997-98	630	261.67	42.49	992
1998-99	890	426.54	47.93	840
1999-00	600	438.98	73.16	877
2000-01	460	353.03	76.74	943
2001-02	720	436.63	60.64	965
2002-03	240	170.12	70.88	1326
2003-04	691	430.84	62.35	1406

Source: (i) Directorate of Ag. Marketing, GoR, Jaipur.
(ii) Agricultural Statistics at a glance, MoA, GoI, New Delhi.

The data in this table makes it amply clear that the market arrival has high correlation with wholesale prices which again has high correlation with international prices of oils and cake. The low market arrivals could be due to the fact that :



(i) The production figures are estimated figures based on revenue data on area and crop cutting information on yield whereas market arrival figures are the quantity sold within the state in different regulated markets.

(ii) Possibilities of sale at sources other than regulated market and also outside the state cannot be ruled out.

The comparison of cost of production with farm harvest prices, wholesale prices and minimum support prices are given in Table 36.

Table 36: Comparison of Cost of Production and Domestic Prices of Soybean

Year	Cost of production (Rs./qtl.)	Farm harvest prices (Rs./qtl.)	Wholesale prices (Rs./qtl.)	Minimum support prices (Rs./qtl.)	International prices Rotterdam (Rs./qtl.)
1995-96	795	835	935	680	1066
1996-97	904	989	1084	700	1099
1997-98	583	944	992	750	1035
1998-99	635	903	840	795	963
1999-00	641	808	877	845	918
2000-01	912	1071	943	865	937
2001-02	NA	NA	965	885	985
2002-03	NA	NA	1326	885	1261
2003-04	NA	NA	1406	930	1467

Source: (i) Directorate of Ag. Marketing, GoR, Jaipur.

(ii) Direction for Agricultural Policy Intervention for Sustainable Agricultural Development of Rajasthan by Dr. R.P. Singh and Dr. K.A. Varghese.

It is revealed that :

(i) The minimum support price has been steadily increasing over the years.

(ii) The cost of production (Rs./qtl.) has been fluctuating over the years due to fluctuations in cost of cultivation (Rs./ha) as well as productivity of soybean.

(iii) The farm harvest prices and wholesale prices have been moving on similar pattern with fluctuations over the years.

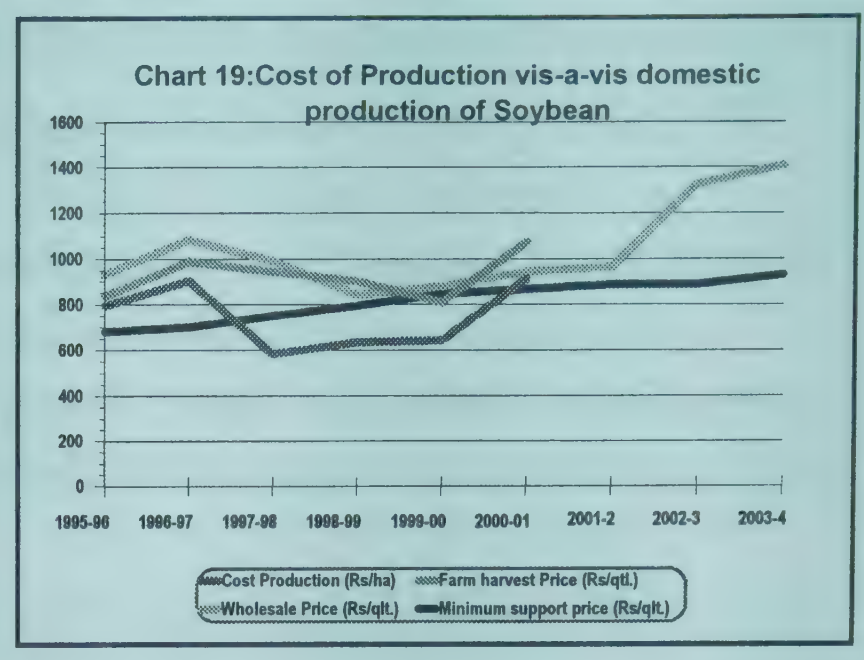
The continuously increasing MSP has acted as an incentive for the farmers to grow more soybean. The fluctuations in FHP and WSP commensurate with the international price movements. Thus, while the price support policies for the government have helped the soybean growers, the price movements in the national market cannot be insulated from international price fluctuations.

8. FARMERS' PERCEPTION ABOUT SOYBEAN

During the course of discussion with grower farmers in the villages of Palaytha (Anta, Baran) and Sarolakalan (Kanpur, Jhalawar) their perception about

the performance/problems of soybean cultivation during last 10 years included :

- Soybean crop has no substitute for economic return.
- Most of the respondents replaced sorghum for soybean.
- Crop is generally grown under rainfed condition and heavy rains at the sowing time spoils the crop.
- Year to year productivity is not stable due to variations in climatic factors.
- Expenditure on seed is high against recommended rate of 80 kg/ha. But generally farmers use higher seed rate to cover the risk of low germination.



- Re-sowing of the crop is very common causing more cost to the farmers.
- In relation to cost of cultivation and production risk, market prices are not remunerative.
- Cost of production is increasing at a faster rate as compared to increase in market price of soybean seed due to hike in prices of diesel, power, plant protection chemicals, etc.
- Minimum support prices of government is not very attractive.
- Procurement centres are away from villages and hence MSP is not effective for small growers, the transport cost being quite high.
- Traders are harnessing more benefits as compared to grower farmers.
- There are lot of problems in the marketing of the produce, delay in finding market deal (specially in peak arrival period), payment, etc.
- Not satisfied with the existing marketing arrangement in regulated markets.

9. SUMMARY OF IMPLICATIONS

Rajasthan agriculture is prone to high risk and uncertainties due to recurrent drought, scanty and erratic rainfall, fragile natural resource base including large desert cover. The large dependence of workforce on agriculture either as cultivators or agricultural labourers for the rural livelihood systems warrants the need to have a vibrant and resilient agricultural set up for the state. The responsiveness of the farming community towards national oilseed production programme has been unassuming leading to record shift in area in

favour of soybean / rapeseed and mustard crop. The implementation of AoA under WTO seemed to have caused for a reversal of the trend for oilseeds in different regions of the country. Some of the implications of the trend in respect of soybean during post-WTO period are summarized below:

- Soybean is a new oilseed crop introduced in Rajasthan during 80's mainly as a part of National Oilseed Development Project/Oilseed Production Thrust Project. Currently there are more than 5 lac growers of soybean in Rajasthan covering an area of 6 to 7 lac hectare in a year.
- Even under the high inter-year fluctuations in the productivity of soybean, the positive growth in area under soybean seems to be a compulsion for the growers in the absence of any economically viable alternative crop. Being a rainfed crop there is a need to protect the interest of soybean growers through policy interventions. The increasing trend in the import of soybean oil and palm oil may go against the interest of soybean farmers of the state in the years to come.
- The sustainable processing of soybean largely depends on efficient and effective disposal of soya DOC. With the decelerating export of soya DOC (4.15%/annum) during the WTO regime, there is a big question mark for soya processors for their survival.
- The increasing trend in the import of cheap edible oils, specially palm oil as well as the increasing share of imported oil in domestic consumption, if not reversed, will adversely effect the domestic production of edible oil which is largely dependent on area growth.
- The cost of cultivation of soybean is increasing at a faster rate as compared to increase in wholesale prices during the post-WTO period and as a result the gross return as well as net return from soybean is getting reduced, posing problem for the continued cultivation of soybean.
- The increasing trend in the import of edible oils may cause set back to the processing industry of soybean which is already taking up the processing activity with limited/meager margin.
- With about 90% actual tariff rate against bound tariff of 300% and unrestricted import of palm oil, the best interest of processors and consumers is not being protected as import of low cost palm oil acts as incentives for blending with high cost domestic oil.
- Any decline in soybean area may adversely affect the rural employment opportunities for family agricultural workers as well as agricultural labourers who do not have much alternative options for employment.

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ABBREVIATIONS

AMS	Aggregate Measurement of Support
AoA	Agreement on Agriculture
CGR	Compound Growth Rates
CPO	Crude Palm Oil
DOC	Deoiled Cake
EU	European Union
FHP	Farm Harvest Price
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
ha.	Hectare
IMF	International Monetary Fund
LPG	Liberalisation, Privatisation and Globalisation
MSP	Minimum Support Price
MTO	Multilateral Trade Organisation
OECD	Organisation for Economic Cooperation and Development
OGL	Open General License
qtl.	Quintal
SAD	Special Additional Duty
SPS	Sanitary and Phyto-sanitary
TMOPP	Technology Mission on Oilseed Production Programme
WSP	Wholesale Price
WTO	World Trade Organisation

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PAIRVI is an independent advocacy support non-profit organisation, which aims to work towards facilitating positive social change through non-violent means, informing both the public and those who frame public policy. In addition, it seeks to support collaborative efforts between individuals and organisations committed to advocating on behalf of the downtrodden and the oppressed.

PAIRVI's mission is to increase the advocacy competencies of various grassroots organisations working in North India, so that they can advocate more effectively in favour of the marginalised, particularly on issues related to caste, class, gender, the environment as well as human rights. PAIRVI also believes that rights and needs of a child are synonymous and thus it is campaigning for child rights at the national level.

Development Coordination Network Committee Trust (DCNC)

It is a state level network of NGOs working in Rajasthan.

Jal Prahari

A specialised network working on water issues in Rajasthan .

Dalit Manavadhikar Kendra (Centre for Dalit Human Rights)

An information and support centre on Dalit issues. Although, its focus is on the state of Rajasthan, it intends to work with dalit groups in other north Indian states.

Social Work Academy for Research and Action-Jaipur (SWARAJ)

SWARAJ was born out of a strong conviction on the part of CECOEDECON to share and disseminate the practical and theoretical knowledge it has acquired over 20 years of experience in human and community development. SWARAJ bears the responsibility of translating CECOEDECON's expertise and experience into customised and tailor-made Certificate, Diploma courses and Training programs for Development Practitioners and Civil Society Actors.

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